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BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 5 1950

REFLECTIONS ON CRIMINAL CONDUCT AND ITS TREATMENT*

BY

Sir DAVID K. HENDERSON, M.D., F.R.C.P.

Professor of Psychiatry, University of Edinburgh

It has seemed to me that the problem of how best to deal with the sick society which exists in our midst to-day has not been discussed comprehensively by anyone who has already given evidence before the Royal Commission. Punishment by any violent and arbitrary method—for example, hanging or flogging—to be administered fairly should be considered in relation to the medical, social, and economic problems which exist. If this is not done then we merely dispose of and deal with a few "tigers" without influencing the tiger problem as a whole. We know that the human race is loaded with imperfections, and in consequence we are not likely to obtain a better-organized society until we have improved the quality of the people who constitute it.

Our mental hospitals and colonies for the mentally defective are crowded to overflowing, and further provision is an urgent necessity. In addition, however, the amount of mental and emotional unrest and instability in the population is increasing rapidly. This is due to the fact, in part at least, that the poorer stocks are increasing while the healthier stocks are tending to diminish, and in consequence a dysgenic situation has arisen whereby the weakly and those potentially liable to mental and nervous upsets are surviving to a much greater age than was the case previously. Socially, the position is complicated by the fact that so many married women are employed in industry. The wastage turnover is high, and leads to unrest, instability, and irritation not only in the factory but in the home. A state of licence and freedom from restraint exists which previously was not the case. The position is complicated by inadequate housing and by the high divorce and illegitimate rate.

Economically, the high cost of living and the state of uncertainty and insecurity in which people live are, I believe, tending to affect the general position and indirectly are influencing the emotional instability which is so prevalent. I believe that it is only by an improvement of the above-mentioned conditions that we are likely to see a better-ordered society. The violent methods of punishment and retribution which have received such universal approval in legal and public circles have little or no constructive value, and make no contribution towards social reformation. The fundamental problem facing everyone interested in human betterment is the improvement of the quality of the race.

*Memorandum submitted to the Royal Commission on Capital Punishment, and published by permission of the Controller of H.M. Stationery Office.

Disorders of Conduct

My interest and experience in relation to the criminal law dealing with persons accused of murder or other serious offences has extended over many years, and has concerned itself essentially with those who, for one reason or another, have been regarded as nervously or mentally abnormal, or at least where doubt has been cast on their sanity. I believe it is generally agreed, medically, that a transitory or more permanent disturbance of the mental faculties of some type or degree plays a significant part in many forms of criminal conduct—for example, murder, suicide, sexual offences, writing threatening letters, fire-raising, etc. Legal and public opinion, however, in judging such offences is apt to adopt a moralistic rather than a medical code and to be sceptical of the findings of the psychiatrist; in consequence, when a medical opinion is submitted it should be stated in terms which can be easily understood and should deal with the actual facts.

Medical theorizing, especially in the witness-box, is as much to be condemned as the hypothetical questions of the lawyer. The estimation and elucidation of a state of nervous or mental disorder—its nature, its severity, its causation and recoverability—is a matter of the greatest complexity which may require repeated examinations, and preferably a period of skilled psychiatric observation, by both doctors and nurses under far better conditions than at present exist. The reason for that statement is because the signs and symptoms of the disorder are so often entirely subjective, and because neither the cell of the accused nor the prison governor's orderly-room or office provides a neutral enough atmosphere for so serious and skilled an examination. Neither the prisoner nor the examining doctor is entirely at his ease.

During the past fifty years our medical knowledge in relation to the various types and categories of nervous and mental illness has been greatly extended, and methods of treatment have been introduced which effect recoveries which border on the miraculous—for example, in syphilitic disorders of the nervous system, pellagra, states of exhaustion and anoxaemia, profound depressive, delusional, and obsessional states. Gaps in our knowledge still exist, but

as our methods of investigation become better defined those gaps should gradually be bridged over, and the how and why of conduct disorder associated with an involvement of the mental faculties may become more fully understood.

One of our great difficulties is that in nervous or mental cases we cannot, except rarely, point to any specific causation as in the case of physical illness. We require to content ourselves with saying that the personality of the individual has become twisted or distorted as the result of a constellation of factors involving the development or lack of development of instinct, hereditary or genetic factors, environmental surroundings, or perhaps more personal matters of a physical or emotional nature. We never can divorce the offence from the life history of the individual. The setting or background in which the crime occurs is an important part of the total picture.

Even with all those points in mind, however, it may still prove extremely difficult to say where sanity ends and insanity begins. The dividing-line is narrow. Sanity and insanity are essentially legal terms which have never been accurately defined. There are many sane persons whose conduct is extremely eccentric and foreign to social custom, whereas there are many technically insane persons whose conduct may never lead them into any serious trouble. In such circumstances we must continue to try to approximate medical and legal opinion, so that, in combination, we can do what is best for the welfare of the individual, whether that involves treatment or punishment.

The legal outlook, in my opinion, is too greatly dominated by an intellectualistic and moralistic point of view, by the concept of reason and free will, and by lack of appreciation of the fact that conduct is motivated by instinctive drives which operate at a much less conscious level. On the other hand, it may be argued that the medical point of view is too liberal-minded, concerns itself too greatly with the individual, and does not fully appreciate its duty to society. But yet it is only by realizing that individualization is the dominant truth of modern medical science, whether applied to disease or to crime, that we look forward more hopefully to the future. The large army of recidivists is the best answer to the arbitrary-sentence methods at present in vogue.

The above general statements may now be applied to the groups of persons with whom I have been particularly concerned : (*a*) those of unsound mind ; (*b*) mental defectives ; (*c*) psychopathic states (character anomalies) ; and (*d*) psychoneuroses.

Persons of Unsound Mind

I am one of those who believe that in cases involving a capital charge the plea of mental disorder in bar of trial or sentence is submitted too frequently. Such a defence is to be deplored in those cases in which there is no special redeeming feature, and when the defence of insanity is really a plea *ad misericordiam* rather than anything else. Doctors and lawyers are equally to blame : doctors because they are too much influenced by sympathy and theory ; lawyers because they have been educated to present every case in as favourable a light as possible. In cases of a less serious type the plea of mental disorder is not submitted often enough, largely because the accused would prefer to serve a defined prison sentence than undergo prolonged treatment in a mental hospital. The danger of such a situation is self-evident, because it is just those cases which merely swell the ranks of the recidivists. Furthermore, it is rare for criminal conduct to be the first sign or indication of mental disorder. The mentally disordered criminal is a person who for years, or months, or weeks beforehand may have given evidence of his mental abnormality, and in numerous cases medical advice may have been sought beforehand. When this has been so it constitutes strong presumptive evidence of the bona fides of the case.

In British courts the method in use of testing the truth of the plea of mental disorder allows both the prosecution and the defence to submit independent medical evidence. There is much to be said in favour of such procedure ; it helps to maintain the liberty and independence of the subject, and as a rule it operates with fairness. Unfortunately in some cases it leads to unseemly wrangling, to a clash of medical opinion, and to a consequent lack of confidence on the part of the public. It was the desire to obviate that state of affairs which led, many years ago, to the introduction of the Briggs Law of Massachusetts. The court appoints a panel of experts to submit a report on the state of mind of the accused, and that report is accessible both to the prosecution and to the defence. It is a method which is worthy of careful consideration. If the panel should fail to agree, then the case goes forward to trial on its merits irrespective of whatever medical evidence there may be.

The M'Naghten Rules

It is cases of psychosis or unsoundness of mind which come into the ambit of the M'Naghten rules. The M'Naghten case is so well known, and the rules have been so fully discussed, that no useful purpose would be served by again considering them in detail. I may, however, be allowed to make certain observations and suggestions. In their day and time the formulation of the M'Naghten rules constituted a definite advance in legal thought and practice ; they set a standard, and they were more or less in conformity with medical knowledge. Now the position has been greatly altered. The M'Naghten rules are no longer in harmony with medical knowledge, and, furthermore, judges themselves vary widely in their interpretation of the rules. This position is greatly to be deplored, because it leads to irritation, which in an indirect way may be vented on the prisoner at the bar. The only way I see of getting round this is by improving the professional training of both the lawyer and the doctor and by the development of medico-legal societies.

In my opinion it is impossible to define degrees of unsoundness of mind—one person is not necessarily more mad than another—but there are many different forms of mental disorder, all of which equally should exonerate a person from a charge of criminal conduct—for example, melancholia, schizophrenia, paranoid states, general paralysis, senile dementia, epilepsy with insanity, and many others. In many of the above cases the individual's mind is sufficiently clear to know what he is doing, but at the same time the true significance of his conduct is not appreciated in relation either to himself or to others. Persons who are proved to be insane in a medical sense are, in my opinion, not legally responsible for the crime which they may commit. I would agree with Lord Justice Clerk Inglis when he said : " In a strictly legal sense there is no insane criminal. Concede insanity and the homicidal act is not criminal. The act of the insane, which in the sane would be criminal, lacks every element of crime."

On the above evidence I believe the M'Naghten rules have introduced a rigid categorizing which may appeal to certain types of mind, but they make the position too academic, and in some respects too easy, so that full effect

is not given to the very special and individual aspects which are present in every case. For instance, most people can understand what is meant by the "nature" of the act, but the "quality" of it can be defined either as synonymous with the physical quality or with the broader concept of "significance." The mentally disordered in many cases realize the physical quality of the act, but they never do realize the full significance of their criminal conduct.

The further moralistic issue of "right and wrong" is hardly ever applicable. In cases in which such a serious issue as capital punishment is involved there is surely little place for rules and formulae, and instead of introducing others, or of adding to or polishing up those already in being, I would suggest that they should be dispensed with altogether. I feel sure that every thoughtful judge who has been trained in criminal law procedure is well qualified to put the issue involved before the jury in such a comprehensive way that every case will be judged on its individual merits rather than in terms of a formula which cannot do complete justice to the individual aspects of each case. It has been said with approval that the M'Naghten rules constitute a yardstick for both judge and jury; but a yardstick is too rigid an instrument when an individual's life is at stake.

While I have always been greatly impressed by the scrupulous care with which a criminal trial is conducted, and by the fact that almost invariably the prisoner is given the benefit of any doubt which may exist, yet that is not to say that conditions could not be improved. I believe, for instance, that in every case involving capital punishment a psychiatric examination would be advisable, just as it is in cases of attempted suicide: the destructive motive is the same in both instances even though the object may be different.

For those persons who have been adjudged as of unsound mind I would advocate:

1. Care and treatment in a special type of mental hospital independent of a prison regime. Provision should be made whereby every method of psychiatric treatment was readily available. Failing acceptance of the above suggestion, then a modern psychiatric department should be established within the prison system.

2. Parole might be used more frequently.

3. Transfer to civil hospitals should be made more often, and dangerous patients in civil hospitals should be more easily and readily transferred to the prison psychiatric unit.

4. Remedial workshops equipped with modern machinery would be a valuable aid in the rehabilitation of such cases.

5. I would suggest that those cases which require observation and a detailed psychiatric report before trial should be transferred, for the time being, to a suitable psychiatric clinic or to a special ward in a mental hospital.

Mental Deficiency

This condition may be defined as a state of retarded development which has been present from birth or an early age and has prevented the individual from keeping pace with his fellows. It may be of various forms and degrees, which to a certain extent dovetail into one another. It constitutes a serious disorder which for all practical purposes is incurable. But yet, curiously enough, the law refuses (except in the most gross cases) to allow mental deficiency to be utilized as a defence in bar of trial or sentence. In many tragic cases in which I have been willing to certify the prisoner as a mental defective I have been informed that "the prisoner is merely mentally defective" and therefore he must stand his trial in a public court just like anyone else accused of a criminal act. Such an outlook constitutes a grave injustice, and the time is long overdue for a recasting of the criminal law in relation to such persons. A prison sentence, long or short, in such cases has no deterrent or remedial effect; it merely adds insult to injury, embitters the enfeebled person still further, and renders him more liable to continue in a career of crime rather than to conform to society. Is it not a complete travesty to suggest that persons who can be certified as mentally defective should be allowed to plead to the charge against them, should be considered capable of instructing their defence and of being able to follow the evidence submitted to the court?

My point of view can be supported by the following cases.

Illustrative Cases

1. An unmarried woman aged 36, who had had two illegitimate children, murdered her third child by drowning shortly after its birth. She was a simple-minded, facile, mentally defective person, who had felt the strain of the childbirth and at the time of the crime was exhausted, sleepless, and distraught. She was subjected to a trial by jury, who found that she had committed the acts charged against her and was mentally defective. The court was then adjourned so that the procurator-fiscal might present a petition for a judicial order committing her to a certified institution.

The necessity for court proceedings under such circumstances seems entirely redundant.

2. An unmarried woman aged 24 murdered her newly born baby by inserting scissors or other sharp instrument into the mouth and throat of the child. The prisoner when 7 years old had already been certified as a mental defective. My examination showed her to be a feeble-minded person with marked intellectual and emotional impairment. As, however, she was "merely feeble-minded," she was regarded as fit to plead, and was tried in the usual manner. It was in this case that the Lord Justice Clerk (Aitchison) made the scathing comment: "If the law had kept pace with medical practice this prosecution would never have arisen. On the medical evidence this woman should never have been brought to trial." The opinion of the Lord Justice Clerk may not have conformed to the letter of the law, but it showed humanity and understanding.

3. An unmarried woman aged 36 cut the neck of her newly born child. The prisoner was a simple-minded, facile person who had not had sufficient realization or understanding to make any preparation for the birth of the child. After the fatal act she was quite unmoved by the tragic situation in which she was placed. The case went to trial and eventually the advocate-depute accepted a plea of culpable homicide to which she pleaded guilty. In this case the Lord Justice Clerk (Aitchison) took the view that she had already been three months in prison and that she could now be safely looked after in her father's home. She was accordingly discharged.

These cases illustrate the unfortunate and pitiful state which still exists. The legal procedure in such cases is antiquated and chaotic, and should be brought more into harmony not only with medical but with public opinion.

My contention is that mental deficiency of whatsoever degree should be regarded as an adequate defence in bar of trial or sentence, and that mentally defective persons who have committed criminal acts should be cared for under hospital or colony conditions until they can be discharged with benefit to themselves and with safety to the public.

Suitable provision for such cases is an urgent necessity, but at present we have neither the buildings nor the necessary medical or nursing personnel to cope with them. I do not ask for leniency in relation to them, but for greater understanding. It should always be remembered that they are mentally defective, that mental defect is one of the most prolific factors in criminal conduct, and that repetition of the offence is frequent. In consequence a return

to social and family life should always be regarded with meticulous care, and should not be considered advisable until a sense of social responsibility has been built up.

Psychopathic States (Character Anomalies)

The individuals who form this group constitute the biggest, most serious, and most controversial medico-legal and social problem. They are social misfits in every sense of the term, persons who have never been able to adapt themselves satisfactorily to their fellow man and appear to be entirely lacking in altruistic feeling. Their life histories are illuminating, and show how, from a tender age and from a variety of causes, they have proved a problem to themselves as well as to the world at large. They are the "sports" of the human race. The more I see of them or read about them or deal with them, the more confirmed I become that they are persons who have failed in the psycho-biological development. Such a failure may not be due to any fault in their environment or education, although that possibility should always be considered, but it is essentially constitutional, something which is inborn, something which is akin to the lack of intellectual development which characterizes the mental defective.

Irrespective of all the efforts which are made to assist them, often from their earliest days, they remain at an immature, individualistic, egocentric level. On this account they fail to appreciate reality; they are fickle, changeable, lack persistence of effort, and are unable to profit by experience or punishment. They are dangerous when frustrated. They are devoid of affection, are cold, heartless, callous, cynical, and show a lack of judgment and forethought which is almost beyond belief. They may be adult in years, but emotionally they remain as dangerous children whose conduct may revert to a primitive subhuman level. Neville Heath and John George Haigh are extreme examples.

On the surface they can behave as ordinary, likeable, attractive human beings, but they harbour in their inner depths instinctive forces which on occasions overwhelm them. In conversation and under controlled conditions no special flaw may be discovered to enable medical certification to be effected; it is impossible in such cases to define sanity or insanity, but it is surely obvious to everyone that we are dealing with conduct abnormality of such a degree and type as to constitute the greatest potential danger to the individual and his victim. They are in the most deplorable of all conditions—not sane enough to be at large and not insane enough (in terms of certifiability) to be suitable for Bedlam.

If our ethical code feels justified in sending them to the gallows then let it be so, but at the same time let us clearly understand that such persons are driven by what may be called their collective unconscious to deeds of violence which are as uncontrollable as a tidal wave. Are we justified, in such circumstances, in attempting to control the conduct of our fellow men by imposing capital punishment in the case of those we do not fully understand? I doubt whether we are. We merely add something to the satisfaction of the murderer, and, paradoxically enough, capital punishment may, instead of deterring others, encourage them to follow the same course.

This was the type of case which Lord Alness had in mind when he promulgated the doctrine of limited or modified responsibility which has been generally accepted by our Scottish courts. May I remind you of Lord Alness's words: "Formerly there were only two classes of prisoner—those who were completely responsible and those who were completely irresponsible. Our law has now come to recognize in murder cases a third class—those who, while they do not merit the description of being insane, are nevertheless in such a condition as to reduce their act from murder to culpable homicide. . . . There must be a weakness or aberration of mind; there must be some form of unsoundness; there must be a mind so affected that responsibility is diminished from full responsibility to partial responsibility; the prisoner in question must only be partially responsible for his action." That is an admirable statement, one to which I can heartily subscribe, and which meets the situation in most such cases. I believe it could be applied with justice to a much wider range of cases—for example, assault, sexual offences, and so on.

During the next fifteen years no capital sentence was carried out in Scotland, and, so far as I know, during that period the homicide rate in Scotland did not increase. While I agree with the position taken by Lord Alness, yet this does not mean that I believe that such cases should be treated more leniently. On the contrary, I believe they should be treated not necessarily with greater severity but under more specialized conditions and for such time as to prevent a possible recurrence of the offence. My plea is for an indeterminate sentence until a sense of social responsibility becomes established. Furthermore, they require to be cared for in a special institution or colony such as has been established in Denmark at Herstedvester, near Copenhagen (see Appendix).

Psychoneuroses

The persons who constitute the various clinical groupings of the psychoneurotic state are those who, while suffering from a vast number of nervous symptoms, are at the same time able to conduct their lives at a reasonable level and even continue at their work. Their number is legion, but their involvement in criminal conduct is comparatively infrequent. For the most part they seem able to exercise sufficient control and understanding whereby in time of stress or conflict they are able to go to someone for help, or else develop in themselves ways and means by which their emotions or disturbing thoughts are kept in check.

It is, however, important to understand that all the vagaries of conduct exhibited by the hysteric, the neurasthenic, the anxiety state, or the obsessive-compulsive are conditions which are not mere foolishness and something which the individual can control. Such states are the result of inner conflicts and emotional disturbances which are overpowering. The medical profession generally subscribe to the view that the signs and symptoms constituting the conduct disorder of the psychoneurotic are determined at a subconscious or unconscious level and are the result of the constant conflict which exists between the good and the evil, between one's conscience and one's instincts. When such conflicts can be resolved the patient may lead a moderately happy and contented life, but otherwise nervous fears, strange thoughts, compulsive acts, may take the field in an attempt, distorted though it may be, to bring matters to a solution. There are some who are willing to go so far as to say that all criminal acts must be determined on the basis of conflict, and that therefore the criminal person should be regarded as a sick person and not as a delinquent. That, however, is an extreme view and one which, in the present state of our knowledge, would not gain general acceptance. I would rather put it in this way—that the conflict which produces criminal acts in the case of delinquents is very much the same type as that which produces psychoneuroses. The problem may be the same, but the reaction is different, depending

upon the structure or make-up of the individual. I have never known a pure obsessive-compulsive state lead to a homicidal attack, but sexual offences are not uncommon.

Conclusion

In summing up the whole of this discussion I would like to say emphatically that I do not believe that medical men, whether psychiatrists or not, have ever wished to take over the functions of judge and jury, or even unduly to influence them in relation to any opinion they may come to. We wish to work in association with the law, because we believe we are able to make some contribution, small though it may be, to the elucidation and understanding of criminal conduct. We are primarily interested in doing everything we can to benefit, to care for, and even in some instances to cure the person affected, but we are likewise concerned with the welfare of society and the preservation of the lieges, and are as anxious as anyone else to live with a sense of security.

I would advocate that the legal and medical professions, so specially concerned in dealing with the disordered group of humanity, should be willing to appreciate each other's point of view and thus avoid scathing comment and criticism, especially in a court of law. It is the purpose of all engaged in the difficult task of estimating human conduct to do what we can to help those who have been unable to help themselves. Great advances can be made if together we are determined to understand and investigate more thoroughly the causes of criminal conduct and how they can be eliminated. Fundamentally this would take us back to a consideration of genetic and environmental factors—for example, housing, education, marriage, and so on—but, while such preventive and eugenic measures should be kept in mind, yet in practice we should, within our prison and legal system if thought advisable, build up an organization whereby the mind and spirit of the offender will come in for consideration to a far greater extent than previously. The essentials are :

1. Good psychiatric units, where satisfactory examination and observation can be carried out previous to trial, and where suitable cases could have adequate treatment after trial.

2. A well-qualified medical and nursing personnel, who, along with social workers and those with an aptitude for research, might bring an investigative spirit to bear on this most difficult problem.

3. An efficient aftercare organization.

4. Discharge to be determined on the basis of social stability. An elastic scale might be devised with minimum and maximum periods—but personal preference is for the introduction of an indeterminate sentence.

5. A special colony establishment under psychiatric control for psychopathic states ; the improvement of working conditions and the use of modern machinery.

6. A judiciary imbued with a remedial outlook and able to think in terms of illness and disease which may be entirely subjective.

7. Modesty on the part of the psychiatrist in relation to his ability to attain cures in the case of individuals who are so grossly and seriously involved.

APPENDIX

I have prepared a short abstract of an article by Dr. G. K. Sturup on the treatment of psychopathic criminals in Denmark. Dr. Sturup is the medical superintendent of the Herstedvester Institution.

The Danish Criminal Law (1930) does not utilize the M'Naghten rules, but states that no person who has committed a crime shall be subject to any punishment if, at the time of the deed, he was irresponsible on account of insanity or a similar condition of mind, or a high degree of mental deficiency. Those cases may be admitted to ordinary mental hospitals.

Herstedvester was established in 1933. There is accommodation for 180 males and 20 females. The period of detention is indefinite. The institution is neither a hospital nor a prison. It is described as a unique social-psychiatric department. Its problem is twofold: to effect satisfactory preventive detention, and to treat patients according to their psychical needs so that they may return to a normal life: detention is described not as punishment but as a security measure.

The majority of the patients are relapsed criminals who have committed serious offences—for example, murder, robbery, incendiarism, rape, indecency to boys or girls—or drug addicts. The detainees vary in age from 18 to 70 years.

The same court which has passed sentence decides whether the detainee may be released, and release is always on a parole basis. Supervision while on parole is effected by officers specially trained by the institution.

There is very close co-operation between the court and the psychiatrist. The medical superintendent is counsellor to the Ministry of Justice, and thus is able to assist or advise every prison medical officer in difficult cases.

In addition to the main institution, a farm near Copenhagen has been developed as a market garden with accommodation for 20 detainees. Some of these detainees have been castrated, because it is believed that after such treatment those guilty of repeated sexual offences can be released on parole with much greater safety.

The staff consists of psychiatrists, nurses, teachers, a sociologist, and warders who have been trained in mental hospitals. Careful medical and social histories of each patient are compiled, and treatment of all kinds is utilized. Trades and occupations such as gardening, printing, bookbinding, joinery, toy-making, and tailoring are engaged in. The detainees work an eight-hour day, and are paid 10 kr. a week ; some earn more. They are allowed to spend half the amount they earn, and the remainder is saved until release is effected.

There is a lively club life, with sport, stamp-collecting, chess, and bridge. Study circles are formed, and in certain subjects correspondence courses are available.

It is asserted that 50% of the detainees go back to normal life in the community. Sturup believes his results can be improved upon.

Speaking at a scientific meeting of the Zoological Society of London on June 13 Dr. J. F. G. Wheeler gave an account of some poisonous fish and said that these were of two types, those which when eaten were followed by internal disorders, and those bearing spines capable of causing poisoned wounds. The first type presented a curiously baffling subject of investigation because the symptoms were not manifested until the cause had disappeared. In the Tropics fish-poisoning was a matter of economic importance. In Mauritius a large number of fishes, especially red fishes, were suspected of poisonous qualities and barred from the markets. According to the account of Charles Grant, published in 1801, fish-poisoning caused the failure of Admiral Boscawen's invasion of Mauritius in 1748. Some of the earlier Dutch seamen calling there referred to poisoning by fish but others mentioned eating fish reported to be poisonous without suffering any ill-effects. With the possibility of fishery development on the vast ocean banks like the Saya de Malha, the assertion that 80% of the fishes caught there belonged to a species (*Lutianus civis* C & V.—locally called Vara Vara) known to be poisonous was not encouraging and called for investigation. In the course of a two-year Fisheries Survey the scientists and crew of "M.F.R.V. No. 1," now renamed *Research*, have discounted these legends.

REACTIONS PRODUCED BY ARTHROPODS DIRECTLY INJURIOUS TO THE SKIN OF MAN*

BY

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During the past few years my colleagues and I have been investigating the reactions shown by the mammalian host to the bites and stings of certain tropical and non-tropical arthropods (Gordon and Crewe, 1948 ; Crewe and Gordon, 1949), and since these reactions are often, although by no means always, confined to the skin we thought it might be of interest to present some of our findings. Before doing so, however, it is necessary to emphasize the fact that we have studied only a few representative species of medically harmful arthropods, and it would therefore be unwise to draw any far-reaching conclusions from such limited data.

Our observations suggest that the pathogenic effects produced by arthropods directly injurious to man fall into certain well-defined groups and can usually be classified in one of four categories: (1) lesions due to mechanical trauma ; (2) lesions due to secondary infections ; (3) lesions due to the injection of substances which are normally harmless, but to which the host has become sensitized as a result of previous exposure ; and (4) lesions due to the injection of directly injurious substances. Although these pathogenic effects are considered separately, they may, and often do, occur in conjunction—a fact which is sometimes overlooked by the clinicians.

Lesions Due to Mechanical Trauma

In the case of the puncture or abrasion made by a blood-sucking arthropod, the extent of the lesion produced will depend on the size and nature of the insect's mouth-parts and the manner in which they are used. Some blood-sucking insects, such as the mosquito, with long and delicate mouth-parts, may feed with the proboscis in the lumen of a capillary ; whereas the proboscis of larger flies, such as the tsetse (*Glossina* sp.), are too bulky to enter the lumen and are used to suck up the blood which results from the repeated laceration of small subcutaneous vessels. It is, of course, obvious that the large and relatively clumsy skin-piercing organs of some of the "horse-flies" or "clegs" (*Tabanidae*) will produce a more extensive wound than will the small and delicate mouth-parts of the midges (*Culicoides*) ; but the difference in the final result is not so great as might be expected, since both insects tend to probe the tissues until a pool of blood, more than sufficient for their purpose, has been produced. From the clinician's point of view, however, it would seem that the uncomplicated trauma produced by any type of blood-sucking arthropod is seldom severe enough to cause any serious disturbance in the host.

When, however, the parasitic arthropod extends its activities from blood-sucking to tissue invasion the resultant trauma may be more extensive. Thus, in the Tropics, myiasis caused by the larvae of certain flies, such as the "Berne fly" (*Dermatobia hominis*), may result in the deep invasion of the subcutaneous tissue by a number of larvae, each of which is more than 1 in. (2.5 cm.) in length, while the invasion of the turbinal mucous membrane, or even of the frontal sinuses, by the so-called "screw-worm" larvae of other flies, such as *Cochliomyia* sp. or *Chrysomyia* sp., may produce even more serious injury: extensive invasions by such large arthropods are obviously not only painful but are bound to interfere seriously with health.

On the other hand, the invasion of the host's tissues by a parasite so minute as *Sarcoptes scabiei*, and one which never penetrates below the stratum corneum, cannot be regarded as causing any serious mechanical trauma, and the extensive lesions sometimes associated with its presence must be ascribed to some other cause. Between these extremes there are a host of tissue-invading parasites, mostly larvae of two-winged flies which in the Tropics and, more rarely, in this country cause varying degrees of mechanical trauma in the tissues of their host.

As already mentioned, a few species of myiasis-causing larvae may produce serious lesions, but with these exceptions, and in the absence of complications, most of the tissue-invading arthropods, so long as they confine themselves to the tissues of their normal host, seldom produce a degree of trauma sufficient to interfere with general health. Occasionally, of course, an invading parasite finds itself in the tissues of the wrong host, as happens in the case of the so-called "larva migrans," and in such instances both parasite and host may behave abnormally. In this case the lesion was probably caused by the larva of an ankylostome normally parasitic in dogs in the Tropics ; but almost precisely similar lesions occur in this country after the penetration of the human skin by the larva of the warble fly (*Hypoderma* sp.), the usual host of which is cattle, or by the larva of the bot-fly (*Gasterophilus* sp.), which is normally parasitic in equines.

Lesions Due to Secondary Infections

It has been shown that the larvae of a few, mainly tropical, species of two-winged flies (Diptera) may produce considerable mechanical trauma. Usually, however, the most serious results of myiasis are those which follow the subsequent invasion by bacteria of the wound previously made by the parasite, and the term "myiasis" generally conjures up a picture of a septic lesion for the cause of which bacteria are more responsible than Diptera.

It sometimes happens that such organisms are introduced by the parasite when piercing the skin, but it seems to be more usual for them to gain access after the abrasion has been made, and such abrasions do not appear to be any more prone to infection than similar lesions caused by other means. In any case, lesions due to secondary infections can scarcely be regarded as being the responsibility of "arthropods directly injurious to the skin of man," and I therefore propose to pass on to my next category.

Lesions Due to Injection of Normally Harmless Substances into a Previously Sensitized Host

The picture which we have just presented of a more or less trivial traumatic injury which may or may not be followed by a more serious bacterial infection is often thought to be further complicated by the injection by the parasite of a substance inimical to the host, the responsible substance usually being thought to be derived from the salivary glands of the parasite, although some workers believe that it originates from some other part of the insect's digestive tract.

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Our own observations do not support this view; they suggest, rather, that only a very limited number of parasitic arthropods secrete a substance of a toxic nature, and when this does occur, as sometimes happens in the case of mosquito bites, the reaction produced is delayed and trivial and never results in the immediate well-marked weal so often associated with the bites of parasitic arthropods.

My colleagues and I have fed a varied assortment of blood-sucking creatures on human volunteers, and, so long as these volunteers have never previously been exposed to the bites of the particular kind of arthropod under investigation, either no reaction has occurred or it has been so slight as to be negligible so far as the clinician is concerned. Of course, it is difficult to ensure that the individual has never previously been exposed to any particular parasite; but this difficulty can be overcome by importing tropical insects, such as the tsetse-fly, and by feeding them on persons who have never visited the Tropics.

As regards the source of the irritating substance, we have been able to show that, in the case of the tsetse-fly at any rate, it must be derived from the salivary glands. This fact has been demonstrated by removing the salivary glands from the living insect and then feeding it on a person who is known to react violently to the bite of the normal insect. In these circumstances the fly feeds to repletion but the host shows no subsequent reaction.

I have just mentioned that persons living in this country and not previously exposed to the bites of the tsetse show no reaction when these insects are fed on them for the first time; the question now arises of what happens if you continue to feed tsetse-flies on such persons. We can answer that question, so far as our observations have gone, by saying that if the flies continue to be fed on such an individual at regular intervals he will remain free from any reaction, but that if the flies are fed at irregular intervals the majority of individuals on whom the flies are fed develop a reaction which may or may not be severe in character.

So far my remarks have been concerned mainly with the tsetse-fly, but we have repeated some of these observations on persons exposed to the bites of mosquitoes, sand-flies (*Phlebotomus* sp.), midges (*Culicoides* sp.), and bed-bugs, and the results obtained have been similar to those following tsetse-fly bites. In addition, we have been able to confirm that these reactions are often highly specific, and that persons who react to one species of insect do not necessarily react in a similar manner when bitten by a different species, although both may be so closely related as to belong to the same genus. These findings may explain why it is not unusual to encounter persons who state that, although they sometimes react violently to flea-bites, at other times they remain unaffected, or that they react to the bites of mosquitoes in one part of the country but not in another.

As regards desensitization, we have not carried out any experiments on the value of antigens prepared from the insects responsible for the reaction, but we have been able to show that, in persons who have become sensitized to the bites of mosquitoes, the reaction diminishes after continued regular exposure, and that this desensitization is usually specific, so that the person who has been desensitized to the bites of one group of mosquitoes, such as the culicines, may still be sensitive to the bites of another group, such as the anophelines.

Perhaps I might summarize the conclusions arrived at by my colleagues and myself concerning parasitic arthropods by saying that, like poor relations, they try to get as much food and shelter as they can from their host, but are scrupulously careful to avoid causing him any unnecessary pain or inconvenience, since the results of such actions are usually detrimental not only to the host but also to the parasite.

It is true that the observations which I have described refer only to a limited number of common parasites; but, so far as those are concerned, it seems reasonable to consider that any immediate and severe reaction associated with their bite or with their invasion of the tissues is due to previous sensitization on the part of the host and not to the injection of any poisonous or toxic substance by the parasite.

Lesions Due to Injection of Directly Injurious Substances

The association between man and arthropod so far considered has been that of host and parasite, and we have shown that, since it is always to the disadvantage of the parasite to cause any serious injury to its host, most of the injuries resulting from this association have been in the nature of accidents caused by secondary infections or following the injection by the parasite of a normally harmless substance into a previously sensitized host. On the other hand, certain arthropods which are non-parasitic and in no way dependent on man for their existence have developed weapons of offence, in the form of secretions which they use to kill or paralyse their prey, while others have developed defensive secretions which they use to protect themselves from interference. These offensive and defensive secretions resemble each other in many respects, and in some instances are used for dual purposes; but generally they differ in their virulence.

In the case of arthropods, such as scorpions and spiders, which have developed predatory habits and which secrete poison that is to be used to kill or paralyse their normal prey, the venom secreted is usually of a high virulence and when injected into man may produce serious general as well as local effects. In the case of other venomous arthropods, such as bees, which have not developed predatory habits, the venom secreted is not intended to kill but merely to produce a sufficiently quick and painful reaction to deter the intruder from any further interference; and in such instances the poison, although quick-acting, is usually of a milder character, the reaction produced tending to remain localized. It must not be forgotten, however, that the stings or bites of usually only moderately poisonous arthropods may take on a serious aspect if inflicted on a previously sensitized person, in whom the result of even a single sting may be followed by severe and sometimes fatal consequences.

The literature concerning the venom of scorpions and bees contains a great number—in the case of bee-venom one might term it a vast number—of papers dealing with the chemical structure and physiological effect of these poisons, together with an almost equally large literature describing the clinical manifestations which have been observed to follow the stings of these creatures; but there seems to be no account of the histological lesions produced. As my colleagues and I wished to compare these lesions with those produced by blood-sucking insects, we undertook a limited number of experiments in which a scorpion or bee was allowed to sting a guinea-pig, the tissues being removed from different animals at various times after the infliction of the sting and then sectioned and examined.

The results of this investigation showed, as might be expected, that, whereas the uncomplicated bites of blood-sucking insects never cause any inflammation and are comparable to the injury which might result from the probing of a surgical needle beneath the skin, the stings of scorpions and of bees result in a very marked inflammation. In the case of the bee, the sections showed oedema, marked cellular infiltration, and some necrosis of the underlying muscle layer, which was followed within 24 hours by a walling-off of the damaged tissue by a palisade of inflammatory cells. In the case of the scorpion sting, the reaction was somewhat similar, though more severe, and was associated with an extensive coagulative necrosis of the underlying muscle.

"Immunity"

There remains one aspect of the association between the skin-piercing arthropod and its host to which, so far, no reference has been made. It is not unusual to encounter individuals who declare that a particular venomous arthropod, such as a bee, will not sting them, or that certain blood-sucking fleas or flies do not bite them. The first group of persons seem to depend for their immunity on their power to handle particular arthropods—in this case bees—without alarming them. The second group is more difficult to explain; unquestionably there are persons who are not so attractive to lice or mosquitoes as their less fortunate fellows, but in our experience such cases are rare, and we have not yet encountered a case of complete immunity.

Pepys—you may remember—declared that while at Portsmouth he shared a bed with a certain Dr. Clarke, and that the fleas bit the doctor but not the diarist, a happening which seems to have pleased the latter "mightily." Pepys's statement can never now be substantiated, but we have carried out a number of experiments in which persons who stated that they were seldom bitten by mosquitoes, together with controls claiming no such privilege, introduced their hands and forearms into a large cage containing many hungry mosquitoes. The cage was arranged in such a way that, though the observer could see what was going on inside, the persons volunteering for the experiment could not. Under these conditions the results of individual experiments were always similar; the persons claiming immunity continued to maintain that they were not being bitten, but the impartial observer recorded in his notebook that the mosquitoes were unimpressed by such an assertion and were biting the "immunes" as readily as the "non-immunes."

It would seem, therefore, that the majority of individuals who believe that they are relatively immune from the bites of a particular species of insect are mistaken, and that their apparent immunity is the result of their failure to notice the insect during the time that it is biting. This failure is due either to the individual's not having become sensitized to the species in question, or because, although previously sensitized, he has become desensitized as a result of regular and prolonged exposure.

Summary

The pathological effects produced by arthropods directly injurious to man—as distinct from those which as transmitters of diseases are regarded as indirectly injurious—can usually be classified in one of four categories.

1. Lesions due to mechanical trauma, in which the damage done is usually severe only when it is caused by certain of the larger species of myiasis-producing larvae or when an abnormal host is attacked.

2. Lesions due to secondary infections—these include the more serious effects of myiasis which follow the infection by bacteria of wounds previously made by invading arthropods.

3. Lesions due to the injection of substances which are normally harmless but to which the host has become sensitized as a result of previous exposure. Recent research suggests that any immediate and severe reaction associated with the bite of parasitic arthropods or with their invasion of the tissues is due to previous sensitization of the host. Such reactions are usually highly specific.

4. Lesions due to injection of directly injurious substances. Certain predatory arthropods, such as scorpions and spiders, secrete venom usually of high virulence which, when injected into mammals, causes both generalized symptoms and an extensive coagulative necrosis of the underlying muscle. In the case of non-predatory insects, such as bees, the reaction tends to be mild and to remain localized.

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DIVISION OF POPLITEAL VEIN IN THE TREATMENT OF SO-CALLED VARICOSE ULCERATION*

BY

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Non-specific ulcers of the lower leg have for a long time been termed varicose ulcers, evidently because varices of the subcutaneous veins were thought to be the cause of the ulcer formation. To-day, however, we know that this is only part of the truth and that the root of this evil goes much deeper. Knowledge of the normal and pathological physiology of the veins of the lower extremity has made very considerable progress during the past decade. Modern investigation tends to regard the entire vascular system of the leg as one system, similar to a U-shaped communicating glass vessel. The aorta and the large arteries form one branch of the vessel, the capillaries the bottom, and the large vein trunks and the vena cava the other branch. Being completely filled with fluid, this system is in perfect hydrostatic equilibrium. If a quantity of blood is introduced into one side of the system, as is the case each time the heart stroke pours blood into the aorta, an equal amount of blood flows out of the other end of the system, from the vena cava into the right side of the heart. This explains how the venous blood is made to return from the lower extremity irrespective of the body's position.

However, when the body is brought into the vertical position another factor is added. It is a well-known fact that in this position, because of the action of gravity, a large quantity of blood assembles in the lower parts of the leg. To explain this it is necessary to remember that the human U-shapel vessel, unlike those made of glass, does not have rigid and impermeable walls. Instead, the blood vessels, especially the veins, have elastic coats which are apt to give way under high pressure. The lumen widens and an ever-increasing amount of blood can accumulate. After some time a condition of pronounced venous stasis is created.

To get rid of this surplus of blood the healthy human being is in possession of a highly efficient auxiliary

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mechanism, consisting of the action of the muscle masses of the calf. When these muscles contract, as in walking, they act as a sort of peripheral heart, squeezing considerable amounts of blood from the lower leg up into the popliteal and femoral veins. From there the blood cannot return because of the action of the valves in these large veins.

It is not difficult to imagine what would happen if those important valves for one reason or another were no longer able to function properly. The blood that was squeezed out of the lower leg would return the moment the muscles relaxed, and no amount of walking or muscle movements would be able to rid the lower leg of stagnating blood. The venous stasis would steadily increase and oedema would soon begin to develop. If prolonged for weeks or years, graver tissue changes, such as induration and even ulceration, would set in, and, as a result of anoxaemia, there would be aching or pain.

It is impossible not to be struck by the fact that the pathological changes just described constitute the exact image of what is to be observed in cases of lower-leg ulcers. An ulcer is hardly ever found quite alone. It is nearly always accompanied by chronic pitting oedema and by large areas of brawny and indurated skin, and the patient generally complains of a dull aching or bursting pain whenever the leg is in the vertical position. In fact, these symptoms constitute the components of what may be called the "lower-leg-stasis syndrome."

The grave circulatory disturbances evidently underlying this syndrome caused me and my co-workers, about four years ago, to start an investigation into the conditions prevailing in the large deep veins of the entire leg. The results of this work have been described in detail elsewhere (Bauer, 1948, 1950a). Using a special phlebographic technique in which the contrast was introduced into the proximal end of the femoral vein, a large series of cases was studied. In practically all cases with a pronounced stasis syndrome the femoral and popliteal veins were found to be in a pathological condition, the main feature of which consisted in the complete, or nearly complete, absence of normally functioning valves.

The aetiological factor in many cases was found to be a previous deep venous thrombosis. When a vein trunk is recanalized after having been obliterated by thrombotic clots, the result is a thick-walled rigid tube without even traces of valves. In an even larger group, however, the valvular insufficiency was caused by phlebosclerotic or similar changes, and might be called idiopathic.

The conclusion was reached that the stasis was caused by this pathological condition of the valves. Later experience from several hundred cases entirely corroborated this view.

Treatment of Venous Overloading

The main problem when trying to devise a suitable therapy appeared to us to be this: in what way would it be possible to assist the action of the peripheral heart, or, in other words, by what action could we prevent the blood that is squeezed out from the lower leg by muscular contraction from flowing back again?

It seemed to us that if the large avalvular vein trunk was permanently blocked at its lower end, in the popliteal region, this would prevent the possibility of back-flow. Division of the popliteal vein was performed in a few cases, and the results were encouraging. The patients improved, and it could be demonstrated radiographically that after operation the calf-muscle contractions drove the blood through numerous fine-calibred channels into the muscle veins of the thigh, and that no back-flow occurred.

It thus appeared as if a suitable form of treatment might be within reach, and ligation and division of the popliteal vein was taken up as a routine procedure and has remained so for more than three years.

Indications for Popliteal-vein Division

At the Mariestad Hospital, up to the time of writing, 245 popliteal-vein divisions have been performed in cases of proved valvular incompetence. The symptoms present at the time of operation are given in Table I. It will be seen that pain, oedema, and indurative skin changes were present in practically all the cases, and that open ulcers or a history of repeated ulceration were observed in seven-eighths of the patients.

TABLE I.—*Leg Symptoms in 245 Patients Before Popliteal-vein Division*

Symptom	No. of Cases in which Present
Bursting pain	243
Oedema	244
Induration	236
Open ulceration	180
History of repeated ulceration but no ulcers open at the moment	33

During the first year of this work all cases were examined by retrograde phlebography before being subjected to popliteal-vein division, because a need for further study was felt. To-day we feel convinced that in practically all cases with a clear-cut stasis syndrome there is also deep valvular insufficiency, and we do not hesitate to operate on the strength of an ordinary careful clinical examination alone, without recourse to phlebography.

In a fair number of cases there will be found, in addition to the typical syndrome, the well-known signs of incompetence of the great saphenous vein or of incompetence of one or two of the large communicating veins arising out of the depths in the lower third of the thigh. In these cases there is every indication to divide and inject or strip these veins as well. It is our belief that no good can possibly come from any vein with a retrograde blood-flow, and it has been our practice for a long time to deal with these veins at the same time as we are doing the popliteal-vein division. We have seen no harm arise from this.

Now and then there come under observation borderline cases in which some of the components of the syndrome are not very well marked and in which, at the same time, a large, tortuous, and incompetent great saphenous vein is demonstrated. In such cases the question may arise whether the lower-leg changes are caused by the saphenous alone or whether there may not, in addition, be a deep insufficiency. In these circumstances phlebography is indicated. The examination should, however, not be done by puncture of the femoral vein. It is much easier to introduce the contrast medium *via* the saphenous vein. This vein must in any case be exposed at its upper end and tied. After tying the lower ligature, but before applying the upper one, the needle of a syringe containing 20 ml. of diodone ("diodrast") (35%) is introduced into the saphenous vein. Before injecting, it is absolutely necessary to make sure that the valves in the superficial femoral vein, if any, are closed at the moment when the dye runs into the vein. According to our experience this can best be done, and the most uniform results obtained, if the foot

end of the operating table upon which the patient lies is suddenly lowered to 45 degrees or more. Then, but not until then, should the injection be made, occupying about thirty seconds. At the end of that period the *x*-ray exposure is made.

If with this technique the contrast medium is seen to have run down into the femoral vein and to have passed the knee level, indications for popliteal vein division are present. If, on the other hand, this technique is not strictly followed, the contrast medium, which is heavier than the blood, may sometimes be observed to trickle downwards for some distance, even in persons in whom there exists no valvular incompetence. Instances are known in which this phenomenon has caused some observers to doubt the value of the method.

At this point it should be mentioned that we have devised a method to make absolutely sure, on the operating table and before actually dividing the popliteal vein, that the femoral vein is incompetent. After exposing the popliteal vein a loosely tied ligature or a clamp is applied on the distal end of the exposed vein. After that, we insert in the vein, proximal to the ligature, the needle of a manometer similar to that used in lumbar puncture but with a much longer glass tube. The foot end of the table is then slowly lowered to 45 degrees. If blood enters the glass tube and rises to a level of 40 to 60 cm., which, incidentally, corresponds to the level of the patient's heart, this is a sure sign that the femoral valves are incompetent.

Results

There were no post-operative deaths among the 245 cases operated upon. No complications were observed, with the exception of slight wound haematomas in five cases. In no case was there any demonstrable harm to the circulation in the lower leg as the result of the operation.

A marked improvement was observed in all the patients. The aching or bursting pain was relieved almost at once. The ulcers generally healed in a shorter time than might have been expected with conservative treatment.

Follow-up Examination

It is a well-known fact that patients with leg ulcers nearly always show a considerable improvement after an interval of hospital care, whatever treatment is given. The utmost care must therefore be exercised when the effect of an additional new form of therapy is to be evaluated. A considerable period of time, preferably several years, must be allowed to pass before final judgment can be pronounced.

In the Mariestad Hospital material only one patient has been observed for more than three years and only 55 have passed the two-year mark. Nevertheless, in order to obtain a preliminary idea of what may be expected after popliteal-vein division, follow-up studies were made of all those cases, 196 in number, in which the time of observation was at least six months. It was found very informative not merely to examine all the patients at a given date but also to follow the course of their illness in detail from the time of operation up to the present (Table II).

TABLE II.—*Post-operative Course After Popliteal-vein Division in 196 Cases. Time of Observation: Six Months to Three Years*

	No. of Cases
Uneventful post-operative course. Steady progress towards complete recovery	165 (84%)
Intervals of recurrence	31 (16%)

In 165 patients the post-operative course was entirely uneventful. These patients were relieved from their previous bursting pain and enjoyed instead an unaccustomed feeling of lightness and comfort in their legs. They had, as a rule, no demonstrable oedema; in a few cases there were at times traces of it in the evening. In all cases the ulcers had completely healed, and remained healed, often leaving no traces. The indurative changes showed considerable regression and in many cases had entirely disappeared. In short, there existed in this group a steady progress towards what looked like complete recovery.

In 31 cases the post-operative course was disturbed by shorter or longer periods of recurrence. These cases were made the object of careful analysis in order to ascertain why recurrence had occurred and how it might be avoided (Table III).

TABLE III.—*Recurrence of Leg Symptoms After Popliteal-vein Division in 31 Cases*

Reason for Recurrence	No. of Cases
Persisting insufficient venous channels	18
Superimposed arterial disease	11
Other reasons	2

It was observed that in not a single case had the major stasis phenomena returned. All of the 31 cases were free from the bursting pain they had had before operation, and with very few exceptions the oedema of the whole lower leg also failed to return. Ulcers, on the other hand, had reappeared at the old site or in a new place.

Upon careful examination the reason for recurrence in 18 cases was found to be the existence of *untreated venous channels showing signs of evident insufficiency*. In some cases these had been overlooked at the time of the operation on the popliteal vein. In another group, with incompetence of the great saphenous vein, this had been noted from the beginning, but no treatment had been instituted because, during the first period of popliteal treatment, some doubt was felt about the wisdom of dividing both the popliteal and the great saphenous veins at the same time. Out of the 18 patients in this group, seven were healed after division of the great saphenous vein and six after leaking communicating veins in the lower third of the thigh had been dealt with. In four patients improved bandaging was sufficient to secure a good result, while one patient remains unhealed.

In another group of 11 patients a very interesting reason for the recurrence of the ulceration was found—namely, *superimposed arterial disease*. In these cases examination showed that the popliteal division had eliminated the previous symptoms of venous stasis and that the recurrence of ulceration was instead caused by obliterative changes in the major arteries of the lower leg, generally at about mid-calf level or higher. A characteristic feature of these cases was the extreme painfulness of the ulcers. While there was none of the old aching all over the lower part of the leg, which had been most pronounced in the daytime, there was a sharp pain, especially marked at night. These ulcers were also found to be extraordinarily slow in healing. The blood pressure in general showed a considerable increase and the pulse in the dorsalis pedis artery was absent. A more detailed report of this condition, which hitherto does not seem to have been sufficiently taken into consideration, has been given elsewhere (Bauer, 1950b).

Treatment with antispasmodic drugs had a favourable effect in two cases only. One patient was healed after

repeated sympathetic blocking. In six cases lumbar sympathectomy resulted in very rapid healing. This operation is probably the treatment of choice.

Post-operative Treatment

This report must not be concluded without a few words on the importance of careful after-treatment. It must be remembered that after popliteal-vein division the blood that is being squeezed out of the lower leg by muscular contractions has to find its way to the thigh through a number of rather fine-calibred veins passing the knee level. Until these veins have enlarged and become fully capable of taking over the entire blood flow there is the risk that some blood may be forced from the depth, through incompetent communicating veins, into the surface veins of the lower leg. To counteract this it is necessary to keep the subcutaneous veins in a state of compression for some time. It is our custom to make all patients wear some kind of supporting bandage for at least two months after the operation. After that time a large proportion of them have been allowed to discard these bandages. Others are instructed to wear them whenever the day's work involves much standing or walking. A small proportion do not seem able to carry on without continuous support.

Summary

So-called varicose ulceration is nearly always found to be connected with chronic oedema, indurative skin changes, and bursting pain. Together, these components form what may be termed the lower-leg-stasis syndrome.

The erect position in man causes a certain amount of venous overloading in the lower parts of the leg. In healthy individuals this superfluous blood is easily removed by contractions of the calf muscles, which act as a peripheral heart. This mechanism postulates normal functioning of the valves in the femoral and popliteal veins.

In patients with the lower-leg-stasis syndrome it has been demonstrated that the above-mentioned large veins are incompetent, their valves having been destroyed by previous thrombosis or by phlebosclerotic processes. In such cases superfluous blood cannot be effectively removed by contraction of calf muscles, every relaxation of these muscles being immediately followed by a back-flow of blood down the valveless main trunk. This results in permanent venous stasis, and in due time is followed by pain and tissue changes.

A remedy for this condition has been devised at the Mariestad Hospital in the form of blocking of the main deep trunk in the popliteal region. After this operation the calf-muscle contractions drive the blood through numerous fine-calibred channels into the muscle veins of the thigh, and no back-flow can occur.

Popliteal-vein division has been performed 245 times. The operation seems to be entirely free from risk. There were no deaths and no complications. The immediate results were favourable. The post-operative observation time is too short to allow a final evaluation of the late results to be made. However, a follow-up examination of 196 cases after six months to three years showed that 165 patients (84%) remained healed and without stasis symptoms. In 31 patients (16%) intervals with recurring symptoms were observed.

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The Association of British Insecticide Manufacturers has published (price 1s., from 166, Piccadilly, London, W.1) a chart summarizing the laws relating to the sale of poisons used to kill weeds, rats, moulds, etc. It is issued in a folder and is suitable for pinning on a door or wall.

TOXIC EFFECTS IN ANIMALS AND MAN AFTER TETRAETHYLAMMONIUM BROMIDE

BY

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Tetraethylammonium bromide (T.E.A.B.) is a quaternary ammonium compound introduced into medical investigation as a vasodilator. It acts by blocking the transmission of vasoconstrictor impulses in autonomic ganglia, and has been used in cases of peripheral vascular disease to assess the capacity for vasodilatation.

Dangerous reactions following its administration have been reported, but do not appear to be sufficiently appreciated. During the course of recent experimental investigations on the action of this drug in animals and man certain toxic effects were observed.

In Animals

During an investigation of changes in peripheral blood pressure following arterial ligation in dogs a 10% solution of T.E.A.B. in doses of 2.5 mg./kg. was given intramuscularly and repeated half-hourly for two and a half to five hours. Preliminary trials had shown that with the animal supine this dosage was just insufficient to cause a fall of blood pressure of more than 10 mm. Hg. Total doses administered before toxic effects developed ranged from 100 to 240 mg., depending on the weight of the animal. For a man weighing 70 kg., doses over similar periods would be 475–1,200 mg. The usual single intravenous dose in man is 400–500 mg. (Boyd *et al.*, 1948). Other doses recommended in the literature are 4–7 mg./kg. (Birchall *et al.*, 1947) and 4–6 mg./kg. (Hayward, 1948), whereas Berry *et al.* (1946) have used 20 mg./kg. intravenously to a total of 1–1.2 g. Therefore although the individual dose per kilogram used in this experiment was well on the safe side, the sum of the half-hourly doses was two or three times that usually given.

In 7 out of 20 dogs toxic effects were noted. The first signs of these appeared after T.E.A.B. had been given for a period of two to three and a half hours: paralysis of intercostal breathing developed, and respiration continued with irregular diaphragmatic movements of diminished strength and frequency. Prominent features were bradycardia and hypertensive change with increased pulse rate —characteristics of the effect of anoxia in dogs. Cyanosis was also apparent. In two animals, when T.E.A.B. was stopped a gradual return to the previous state occurred over a period of one to one and a half hours. The remaining five died. In three of them normal respirations almost ceased, an anoxic hypertensive state followed, and death occurred 15, 20, and 60 minutes later respectively; during this time the few respiratory efforts were feeble and jerky in nature and entirely diaphragmatic, but as a result of movements of the heart some diffusion of air in and out of the lungs occurred. In the other two a slow rise in systemic blood pressure and in pulse pressure was followed by sudden respiratory failure and death. At post-mortem examination the only positive finding was gross dilatation of the heart and large veins.

In Man

Seven subjects undergoing investigation (Burt and Graham, 1950) were given T.E.A.B. intravenously in doses of 250–500 mg. in two to four minutes. In six no abnormal reactions occurred. The remaining subject, a healthy woman aged 22, developed paralysis of curariform type after being given 300 mg. of T.E.A.B. intravenously over two minutes. The pulse rate immediately rose from 70 to 80. After 15 minutes she became drowsy, was unable to speak or to raise her upper eyelids, and showed loss of power in neck and arm muscles with periodic twitchings of limb muscles. There was paralysis of intercostal respiration; diaphragmatic respiratory movements increased in magnitude, affecting blood-flow tracing in the foot, and the respiratory rate rose from 18 to 30 a minute. The skin colour remained good. The drowsiness deepened into a state in which there was no response to questions or commands. When the eyelids were lifted up the pupils were found to be moderately dilated with loss of light reflex, and both eyes rolled irregularly. During this time the blood pressure rose from 126/86 to 136/90, and there was a rise both in blood flow and in skin temperature in the hand, and a transient but not marked rise in the foot. An hour after injection the subject could partly open her eyes, and after tilting her head backwards could count fingers. Power of hand muscles and of speech was returning, though cerebration was still very slow. Two hours after injection walking was possible. There were no further after-effects.

Discussion

Previous reports of toxic effects following the use of tetraethylammonium compounds suggest that these are similar in man and in animals. Marshall (1912, 1913) demonstrated the curariform actions of the quaternary ammonium salts in animals. Birchall *et al.* (1947) produced alarming curariform effects in man with doses of 32 mg./kg. of tetraethylammonium chloride. Artificial respiration was required to compensate for the intercostal nerve paralysis and insufficient diaphragmatic breathing. Asthmatic subjects seem particularly prone to respiratory distress after the administration of T.E.A.B.

Schwartz (1949) found that asthma was aggravated in four out of seven cases; one subject "became pulseless, gasped for breath a few times, stopped breathing, became unconscious," and died after only 230 mg. of T.E.A.B. Schwartz believed that the most likely explanation was "a sudden excessive hypotension due either to lowering of the blood pressure or to ventricular fibrillation analogous to the paroxysmal tachycardia" observed by Friedlich *et al.* (1948). Their case was also an asthmatic, and developed ineffectual gasping respiration of an alarming nature, followed by hyperventilation. However, the mode of death in the case reported by Schwartz is similar to that of the animals in the present report, which is attributed to respiratory failure.

Although Lyons *et al.* (1947) believe that large doses of T.E.A.B. cause death from central respiratory depression without curariform paralysis of respiratory muscles, the evidence presented above suggests that the latter effect is the more common. The close similarity between the toxic effects of T.E.A.B. in animals and those in man has not been sufficiently stressed, and indicates that curariform paralysis is a danger to which both are prone.

Summary

Toxic effects in animals and man following the administration of tetraethylammonium bromide are reported. Out of 20 dogs to which T.E.A.B. was administered in large doses seven died—five from curariform paralysis of intercostal and diaphragmatic muscles, and two probably from central respiratory paralysis. A similar but not fatal curariform paralysis in man is reported.

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THE MANAGEMENT OF HEAD INJURIES FROM THE ANAESTHETIST'S POINT OF VIEW

BY

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The anaesthetist has much to contribute to the care of the unconscious patient, no matter what the cause may be. In respect of their management, patients suffering from barbiturate poisoning, poliomyelitis, and acute head injuries have much in common, though the last group provides the greatest variety of problems.

Factors Against a Clear Airway

The maintenance of a clear airway is the immediate consideration, since this may be menaced by any of four factors or by a combination of them.

1. *Depression of Reflexes.*—Quite apart from the fact that in any unconscious patient the tongue may fall back and cause a respiratory obstruction above the glottis, a head injury may be severe enough to obtund reflexes essential to life. If the cough reflex is in abeyance the trachea is no longer protected from invasion by foreign bodies.

2. *Gastric Motility.*—War injuries repeatedly showed that injury reduces gastric motility, and as a result the stomach will retain its contents for many hours afterwards (Macintosh, 1949). Since so many head injuries occur on the roads after "closing-time," a full stomach must be expected. If the patient remains conscious this offers no danger to life, but in one whose reflexes are depressed, as a result of either a head injury or a general anaesthetic, vomiting may lead to a fatal respiratory obstruction.

Case 1.—A man aged 69 was admitted to hospital with a compound fracture of the frontal bones, the result of being knocked off his bicycle. In the casualty department he was deeply unconscious, but his general condition was satisfactory and his airway good. He was therefore sent direct to a ward. After he had been lifted into bed it was noticed that his respiration

was stertorous. He was then slightly cyanosed and his pulse rapid and feeble. An anaesthetist was called, but by this time respiration had stopped. A laryngoscopic examination revealed a considerable quantity of stomach contents in the pharynx and trachea. This was aspirated immediately and artificial respiration started, but the patient died within ten minutes. At necropsy the lungs were found to be full of vomitus.

3. *The Direct Results of Injury.*—These include fractures of the mandible, which make it difficult to retain the tongue forward, and bleeding from the mouth, nose, tongue, or from the base of the skull. In an unconscious patient particularly, these can lead to a serious respiratory obstruction.

4. *Pulmonary Oedema of Central Origin.*—Although this complication is more common some days after injury it may develop almost immediately, and it is most frequently associated with injury to the mid-brain. Experimentally, the condition, which resembles the pulmonary oedema of heart failure, has been reproduced in animals by the injection of fibrinogen into the fourth ventricle. Cameron (1948) reports that at necropsy pulmonary oedema was found in 67% of patients with non-traumatic intracranial haemorrhages and in 63% of patients with fractured skulls. He believes that the condition is due to a disturbance of intracranial pressure.

The treatment of the patient unconscious as a result of a head injury is important, for not only may it be life-saving but it may also influence the later management of such cases.

Immediate Treatment

A stomach tube should be passed at the earliest possible moment. There is no justification for not doing this, for even if the stomach is empty no harm can result. The procedure may be of inestimable value, particularly when the patient is to be moved any distance, short or long, for during transit skilled attention and facilities for treatment are unlikely to be at hand.

An adequate airway may be maintained by (*a*) posture, (*b*) manual control of the jaw and tongue, or (*c*) artificial airways; but even an endotracheal tube is not foolproof unless properly supervised; nor, unless a means of suction is at hand, can it overcome the respiratory embarrassment caused by excessive bronchial secretion or blood. Case 2 illustrates four undesirable sequelae of intubation in an attempt to ensure an airway.

Case 2.—A man aged 42 was found unconscious on the road-side after a motor-cycle accident. He was taken to the local cottage hospital, where he was intubated through the mouth with a No. 8 Magill tube before being transferred to a larger centre. When I first saw this patient, 14 hours after injury, his respirations were rapid and stertorous, and he was slightly cyanosed. Respiratory obstruction was suggested by indrawing of the chest wall on inspiration, and this was confirmed by the character of the breath sounds through the tube, which showed that the latter was not fulfilling its function. The tube was therefore removed, and under direct vision a quantity of thick purulent mucus was aspirated from the pharynx and trachea. The cords were seen to be ulcerated and there was a gross tracheitis. Forty-eight hours later the patient died, and at necropsy the ulceration of the posterior borders of both cords was confirmed and a tracheitis which amounted to frank ulceration extended to the carina. The trachea was full of purulent mucus.

Examination of the endotracheal tube after its removal showed that it was so long that the tip must have entered a bronchus: this was not diagnosed during life, as the clinical picture was complicated by multiple fractured ribs. The lumen of the tube was greatly reduced by mucopus, which had become so inspissated and adherent to the inner wall of the tube that it could not be removed by aspiration. A transverse marking on the concave border of the tube was probably the result of repeated kinking caused by movement of the patient's head during the ambulance journey. Finally, the severity of the tracheitis suggested that the irritation might be chemical rather than mechanical, and suspicion became a strong probability when the fumes of formalin detected by the nose were strong enough to cause lacrimation.

Despite its limitations, I believe that an endotracheal tube may be recommended as a means of retaining an airway, provided that the dangers are fully recognized, and provided that a proper airway cannot be maintained by simpler measures—that is, manual control, a Waters airway, or correct posture. The last-named is, in any case, of the greatest importance. The supine position must be condemned not only because it permits the tongue and jaw to fall back and occlude the pharynx but also because the direction of the trachea prevents drainage of secretions from the lungs and encourages blood and vomit to run down the respiratory tract. The presence of an endotracheal tube does not prevent this, since it does not occlude the glottic opening in the deeply unconscious patient, whose cords may be widely separated. Thus the semi-prone or "tonsil" position with a head-down tilt should be adopted, for this encourages drainage from the trachea, prevents the inhalation of foreign bodies, and allows the jaw and tongue to hang forwards (Macintosh and Bannister, 1947).

Management in the Later Stages

This period starts as soon as the patient is in bed in a ward and continues until consciousness is regained. Once more the overriding consideration is that of maintaining an airway, because even a minor degree of obstruction, if allowed to persist, may lead to pulmonary oedema and cardiac failure (Macintosh and Mushin, 1946). It is well known that an endotracheal tube will cause ulceration of the cords and trachea if left *in situ* for a long time. What period may elapse before harm results is unpredictable, but I consider that twenty-four hours should be regarded as the time limit. It is therefore essential to make an assessment of the probable period of unconsciousness as early as possible. This estimate may be wide of the mark, but an opinion should be formed whether the patient is likely to regain consciousness in a few days or only after a matter of weeks.

In cases of prolonged unconsciousness an endotracheal tube is out of the question, and with the best will in the world manual control of the jaws is inefficient, especially as this duty is commonly relegated to a junior nurse. Further, the longer the patient remains unable to clear his own secretions by coughing, the more essential does it become to remove them by other means. Pharyngeal toilet alone can never be completely effective, and, since repeated intubation is both undesirable and impracticable, an early tracheotomy is indicated.

Tracheotomy

Not many years ago oxygen was administered, not for any therapeutic value, but as an inevitable last rite to the dying. To-day tracheotomy is regarded in much the same light, and the advantages it has to offer are never seen, because more often than not the operation is performed on a moribund patient. A timely tracheotomy, in fact, ensures a safe airway and a ready access for tracheo-bronchial toilet, without which the patient will assuredly die from a combination of asphyxia and lung infection. A minor operation in the hands of a competent surgeon, tracheotomy is a small price to pay for the

advantages it bestows. To regard tracheotomy as too drastic an undertaking shows a failure to appreciate the gravity of the issues at stake. All too frequently patients with head injuries die, not from their primary injury, but from a chest complication which might have been avoided altogether, or at least mitigated, if efficient bronchial drainage had been established early.

A tracheotomy by itself is not sufficient. It must be combined with frequent changes of posture, at least hourly, to allow secretions from the various lobes of the lungs to drain into the more accessible bronchi or trachea, from which they may be removed by suction. A warning is necessary if a tracheotomy is considered only after an endotracheal tube has been in place for a long time. If there is any degree of tracheitis or ulceration of the cords there is a risk that the tracheotomy wound may become infected, and this in turn will lead to fibrosis, and possibly to stenosis of the glottis and a permanent tracheostomy.

Case 3.—A man aged 28 was admitted to hospital with a severe head injury as a result of a road accident. He was intubated soon after arrival, and except for short intervals the tube remained in position for four days. By this time his cords were ulcerated and an attempt was made to maintain an airway by a relay of nurses holding his lower jaw forward. After three days a tracheotomy was performed. A clear airway was assured, and the patient, though remaining unconscious, was kept free from lung complications for a whole year. The improvement of his cerebral condition was slight, but as the cough reflex returned an attempt was made to close the tracheotomy; this had to be abandoned because of a complete stenosis of the glottis. The criticism here is not that a tracheotomy was performed but that it was performed too late.

Bronchoscopy is a valuable manœuvre, and should be performed if there is evidence of atelectasis or if secretions cannot be removed by "blind" aspiration. The importance of early bronchoscopy must be stressed, for it will be of little value if withheld until secondary changes appear in the lungs as the result of infection or obstruction of the bronchi. By itself it is only a temporary measure, and must therefore be used as an adjunct to the general treatment already described.

The previous cases show the pitfalls which abound for those concerned with the management of the unconscious patient. Case 4 is included, therefore, to show how satisfactory the result may be when the treatment as advocated in this paper is followed and is instituted at the correct time.

Case 4.—A man aged 66 was admitted to hospital after a fall from his bicycle. He was unconscious and a diagnosis of subdural haemorrhage was made. In spite of a decompression he remained unconscious. Twelve days after the accident, during which time he had become increasingly "chesty," he developed a left lower lobe atelectasis. The temperature rose to 101° F. (38.3° C.), pulse to 110, and respirations to 30. He was slightly cyanosed. Bronchoscopy was performed and a quantity of mucopus was aspirated, mainly from the left side. A tracheotomy was performed the same day, and a further quantity of mucopus was removed. Changes of posture to encourage drainage from the lungs were made more frequently, and on the following day the temperature had fallen to 99° F. (37.2° C.), the pulse to 90, and the respirations to 25. Six weeks after injury the patient was co-operative and making a good recovery. The cough reflex had returned and the tracheotomy was therefore closed.

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CONGENITAL ATRESIA OF THE OESOPHAGUS

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Congenital atresia of the oesophagus is commoner than is generally realized, and if recognized early can be amenable to surgical treatment. The condition is very readily overlooked, but if the possibility is borne in mind it can be diagnosed without difficulty. The purpose of this article is to report a series of cases in support of these statements and to describe the technique of treatment that has been carried out at the Department of Thoracic Surgery of the Frenchay Hospital.

Incidence

The incidence of congenital atresia of the oesophagus has been stated to be about 1 in 2,500 births (Franklin, 1947; Grey Turner, 1949). In our experience the incidence is much greater than this, presumably because many cases are not recognized and deaths are regarded as having been due to atelectasis or pneumonia.

One of us is a consultant paediatrician to a clinical area with a population of about 100,000 in which there are approximately 2,000 births annually. He has seen five cases during the course of two years. The first was in May, 1948, and the patient was 6 days old and very ill with pneumonia, which terminated fatally before surgical treatment could be arranged. The diagnosis was confirmed at necropsy. The remaining cases are described below, being Nos. 2, 4, 7, and 10.

The incidence of cases in this clinical area in which the diagnosis was confirmed was thus 1 in 800 births. It is not to be assumed that all such cases were referred for consultation or that they were diagnosed if so referred. Hence it is reasonably certain that the incidence is distinctly greater than 1 in 800. There is no justification for believing there may be a special incidence of the condition in the area where these observations were made. No epidemic of rubella or other disease that might cause it has been recognized and there has been no undue incidence of other congenital abnormalities.

It is easy to understand how the condition can be overlooked. It presents no easily recognized signs. The infant brings up some frothy mucus during the first day or two of life. Attempts at feeding lead to regurgitation, choking, and probably cyanosis. These events in a newly born infant may call for no special concern on the part of the nurse. By the third day chest symptoms are developing which are attributed to infection, and all further feeding difficulties and respiratory distress are attributed to pneumonia. This terminates fatally when the infant is about a week old, and the cause of death seems obvious. If a necropsy is performed the oesophageal condition is very easily overlooked.

In our cases we have noticed that the condition is often associated with atelectasis, particularly of an upper lobe. The reason for this is not altogether clear, but it may arise from inhalation of saliva, the right upper lobe being a common site for any inhalation phenomenon. Inhalation

of feeds is not necessarily an explanation, since in two cases the atelectasis had been recognized before any feeds were given. This may explain why some cases are overlooked. The atelectasis is recognized, and is regarded as the explanation of the infant's condition. The oesophagus is not examined.

We want to emphasize that congenital atresia of the oesophagus probably has an incidence comparable to that of congenital heart disease. Unlike the latter condition, no infant can survive without the prompt aid of the surgeon. Early diagnosis is essential, and if this is to be achieved it is imperative that all concerned with the care of infants during the first few days of life should be aware of the condition and understand when its presence should be suspected.

Pathology

In most cases the anatomical abnormality conforms to the pattern described by Vogt (1929) as Type 3 (b). There is a complete and considerable gap in the intrathoracic oesophagus; the upper segment ends blindly at the level of the superior thoracic inlet, is dilated, and is often densely adherent to the posterior wall of the trachea. The lower segment is narrow and poorly developed, and opens into the posterior wall of the trachea by a vertical slit just above the bifurcation. Rarely, the lower segment is deficient or entirely absent, and there is no tracheo-oesophageal fistula (Vogt Type 2). The extent of the defect in the viscus varies from a thin mucosal obstructing web to complete absence. The position of the tracheo-oesophageal fistula is also variable, and may involve the upper segment or, occasionally, both segments. Cases of tracheo-oesophageal fistula without atresia have been described.

Other congenital abnormalities may be present, but these are rarely incompatible with life. In our own cases the commonest coexisting abnormality has been multiple accessory auricles.

Clinical Manifestations

Most articles published on this condition give rather inadequate descriptions of the clinical manifestations and describe as the typical symptom attacks of cyanosis and choking on attempting to feed. We venture to suggest that this is comparable to describing faecal vomiting as the typical symptom of intestinal obstruction. Feeding these infants is bound to lead rapidly to inhalation pneumonia, and we consider that it is most desirable, and often possible, to recognize the condition before any feeding is attempted. Such recognition before feeding would be achieved more often if midwives and nurses were aware of the condition.

A characteristic feature in most cases is that these infants bring up froth. This has not received adequate recognition in the literature. Many infants will produce some bubbly mucus for a few hours after birth. In contrast the infant with oesophageal atresia brings up a froth comprised of rather smaller bubbles, and this continues or increases. Occasionally the froth is bile-stained. Any infant that is bringing up frothy mucus 24 hours after birth should be investigated for possible oesophageal atresia. Furthermore, no feed should be given until this condition has been excluded by passage of a catheter into the stomach.

Respiratory distress and signs of atelectasis may present themselves before a feed is given. The infant's condition may then be attributed to the atelectasis, which is thought to be an explanation for the subsequent developments. Any infant that is reasonably mature and for no adequate reason presents signs of atelectasis should have a catheter passed into the stomach to exclude possible oesophageal atresia.

A further important sign of the condition is a distended and tympanitic abdomen; the distension, moreover, tends to increase whenever the infant cries or strains. In most cases a lower oesophageal segment is present and communicates with the trachea through a fistula situated just above the bifurcation. Any rise in the intrathoracic pressure forces air through the fistula into the lower oesophagus and thence into the stomach. In the rare case of complete atresia, in which no tracheo-oesophageal fistula is present, the abdomen is dull and no gas can be demonstrated in the intestines on *x*-ray examination.

In every case the infant must be carefully examined for other congenital abnormalities.

Diagnosis

Once suspected, the diagnosis can be quickly and easily confirmed by passing an adult-size rubber catheter into the upper oesophagus. An obstruction is encountered 3 to 3½ in. (7.5 to 8.8 cm.) from the gums. If a thin catheter is passed it may coil up in the blind oesophageal pouch and give the impression that it is passing into the stomach. If an obstruction is suspected all feeds by mouth are withheld, and 15,000 units of penicillin are given by injection immediately, and repeated three-hourly. Survival of the infant is dependent upon early diagnosis, early admission to hospital, and early operation before the lethal complications of the condition have supervened.

A trained nurse armed with a catheter and some means of applying suction—a rubber-bulb Dakin syringe is probably the best, as it can be used with one hand—should accompany the infant to hospital in the ambulance, so that the pharynx can be kept clear of mucus.

On admission to hospital penicillin administration is continued, and mucus is aspirated from the pharynx as quickly as it accumulates. If the lungs are wet and the infant cannot be induced to cough by passing the aspirating catheter down to the epiglottis, postural drainage is employed by placing the infant in the face-down head-low position and gently slapping it on the back.

As the emphasis is on quick diagnosis and early operation to restore bowel continuity, it is questionable whether any time should be devoted to attempts at restoring fluid balance by giving subcutaneous salines, unless the infant is remarkably dehydrated. In our experience this is unusual in the first three days of life.

Without delay an antero-posterior film of the chest and abdomen is taken to reveal the extent of the pulmonary atelectasis and to confirm the presence of gas in the intestine. If no gas is present the inference is that there is no tracheo-oesophageal fistula, and in all probability the lower segment is deficient or absent. In these circumstances immediate restoration of bowel continuity is probably impossible and the surgical treatment has to be modified. The catheter is again passed into the upper oesophagus, and 0.5 ml. of iodized oil is injected and its progress viewed under the fluorescent screen. It is unnecessary and dangerous to inject larger quantities. Barium must never be used owing to the risk of its entry into the lungs. After antero-posterior and lateral radiographs have been taken, the iodized oil is immediately aspirated again.

The radiological confirmation of the diagnosis by the method outlined should be undertaken only in the unit where surgical treatment can follow immediately. It cannot be stressed too often that this condition is an acute surgical emergency, and any step that may delay operation should be avoided; this applies especially to the repetition of diagnostic procedures in the various hospitals through

which the infant may pass before reaching the operating theatre.

No case is too hopeless for operation, but we have reason to believe that some cases are never referred to the surgeon, "because they appear moribund." The worse the condition of the infant the greater the indication for immediate action.

Treatment

Chemotherapy, pharyngeal aspiration, and postural drainage are continued while the above investigations are being carried out. A slow-drip blood transfusion is begun and an injection of atropine given. The infant's colour and general condition will probably have improved since admission as a result of the removal of secretions from the air passages.

The success of surgical treatment depends to a large extent on the skill of the anaesthetist, who should preferably have special experience of both thoracic surgery and anaesthesia in infants.

The technique of the operation performed in this unit differs in detail from the procedure normally adopted. Under intratracheal ether anaesthesia the fifth rib on the right side is resected subperiosteally and the right pleural cavity is widely opened. The mediastinal pleura is incised, the azygos vein is ligated and divided, and the upper and lower oesophageal segments are identified and dissected from the surrounding mediastinal structures. The upper segment may be densely adherent to the posterior wall of the trachea. The lower segment is divided close to the trachea and the fistula closed. The next step is of great importance: the upper end of the lower oesophageal segment derives some or all of its blood supply from the trachea, and after closure of the fistula cyanosis of the cut end of the oesophagus is usually present. Even though it increases the gap between the two oesophageal segments and renders the subsequent anastomosis more difficult, the cyanotic tissue must be trimmed back until free bleeding from the cut edge is seen. Omission of this step was probably responsible for the breakdown of the anastomosis and the death of three infants in this series.

The blind upper segment is opened, drawn down to the shortened lower segment, and an end-to-end anastomosis performed with one row of interrupted 45-gauge stainless-steel-wire sutures. The mediastinal pleura is not sutured. The lung is re-expanded by the anaesthetist and the chest closed without drainage. During the operation 200 to 300 ml. of blood is given and the drip continued with N/5 saline for the next 12 hours. The infant is placed in an oxygen tent. The pharynx is aspirated frequently to remove excess mucus and to stimulate the infant to cough.

No gastrostomy or jejunostomy is performed. Feeding by mouth begins 24 hours after operation, and ½-oz. (14-ml.) feeds of sterile water are given every two hours.

In those rare cases in which no tracheo-oesophageal fistula is present and the lower segment is deficient the operative technique is modified. The blind upper segment is brought out to the surface on the left side of the neck and is opened to allow buccal secretions to escape, to prevent their aspiration into the lungs. The deficient lower oesophageal segment is dissected free from the mediastinum and pushed down into the peritoneal cavity; the oesophageal diaphragmatic hiatus is then closed. The abdomen is opened, and, after freeing the upper half of the stomach by division of the left gastric artery and gastro-splenic omentum, the lower stump of the oesophagus is brought to the surface as a gastrostomy. An immediate cervical oesophago-gastric anastomosis is not attempted, but the procedure is deferred till a later date.

Results of Treatment

The many surgeons in this country now interested in this problem almost certainly have a few successes to their credit, and the time has come for the pooling of information regarding not only the survivors but the failures as well, to stimulate physicians and midwives to consider the diagnosis earlier and to take the necessary steps to have it confirmed.

Ten cases have been treated surgically in this unit. Of these patients five are alive and well and five died after operation. There have been two deaths in the last seven cases. In all instances a right transpleural thoracotomy was performed under intratracheal ether anaesthesia; in nine the fistula was closed and bowel continuity restored by an end-to-end anastomosis; in the remaining case no anastomosis was possible, owing to the absence of the lower oesophageal segment, and the infant is thriving on gastrostomy feeds pending a cervical oesophago-gastric anastomosis at a later date. No late complications have been encountered in the survivors.

A brief review of the fatal cases is instructive. One infant, in whom the diagnosis was not made till the fifth day of life, when bilateral bronchopneumonia was already present, died 12 hours after the operation from the lung infection. Another patient, a puny premature infant of 4 lb. (1.8 kg.), 2 days old and almost moribund on admission, died 10 hours after operation from extensive pulmonary atelectasis, which, after recovery from anaesthesia, developed owing to the infant's inability to cough. This infant might have been saved by bronchoscopy.

The three remaining patients all died of infection resulting directly from a leak at or near the site of the anastomosis. In none of these three was the blood supply to the lower segment safeguarded by trimming back the cyanotic upper end. In the light of our more recent experience it is not unreasonable to assume that these three might well have survived if this most important factor had received due consideration.

Case Records

Case 1.—A male infant 5 days old was admitted on October 18, 1946. Since birth there had been regurgitation, frothing, and cyanosis. His general condition was very poor, with evidence of bilateral bronchopneumonia. Gas was present in the bowel. Operation was carried out immediately without blood transfusion. The fistula was closed and an end-to-end anastomosis done. He was dyspnoeic and cyanosed for a considerable time during induction of anaesthesia and died 12 hours after operation from bronchopneumonia.

Case 2.—A male infant 5 days old was admitted on June 28, 1948, with a similar history. His general condition was poor; the lungs were very wet; the right upper lobe was collapsed; and the abdomen was distended with gas. Immediate operation was performed, with blood transfusion. The fistula was closed and end-to-end anastomosis done without trimming back the ischaemic lower segment. Evidence of a leak at the anastomosis appeared two days after operation. Gastrostomy and drainage of right pleura by intercostal catheter were carried out. He died on the eighteenth post-operative day with bronchopneumonia, undrained loculated basal empyema, oesophago-pleural fistula, patent ductus, and patent foramen ovale.

Case 3.—A male infant 4 days old was admitted on December 1, 1948. He had had cyanosis and regurgitation since birth and his general condition was poor. The right middle lobe was collapsed, and gas was present in the bowel. Blood transfusion and immediate operation were performed, with closure of the fistula and end-to-end anastomosis. The infant died on the fifth post-operative day with tension pyopneumothorax due to a leak at the anastomosis. The ischaemic lower segment of the oesophagus was not trimmed back in this case.

Case 4.—A male infant aged 2 days, admitted on December 18, 1948. No feeds had been given owing to frothing since birth. The right upper lobe was collapsed and the abdomen distended with gas. His general condition was fairly good. Blood transfusion and immediate operation were done; the fistula was closed and end-to-end anastomosis performed after resecting the upper centimetre of the lower segment. Convalescence was uneventful. He was fed by mouth from the second post-operative day. A post-operative barium swallow showed a well-functioning anastomosis.

Case 5.—A male infant 3 days old was admitted on April 24, 1949, with a characteristic history. He was very dehydrated, his general condition was poor, and he was passing no urine. The right upper lobe was collapsed and the abdomen distended. Blood transfusion and operation were carried out, the fistula was closed, and end-to-end anastomosis performed with great difficulty, as the upper segment was very short and only just reached the apex of the chest. The lower segment was cyanosed, but had it been resected the gap could not have been bridged. There was evidence of a leak on the fifth post-operative day; the empyema was drained and gastroscopy performed. He died on the ninth post-operative day from suppurative pericarditis.

Case 6.—A male infant 2 days old was admitted on August 29, 1949. No feeds had been given on the first day owing to frothing. On the second day two feeds were given and both were regurgitated; cyanosis was present after the second. His general condition was good. The lungs were dry and there was no gas in the intestines. Blood transfusion and operation were performed: no fistula was present and no anastomosis was possible, as the lower segment was deficient and extended only 2 cm. above the diaphragm. The chest was closed and cervical oesophagostomy and gastrostomy were performed. Convalescence was uneventful. The infant is now thriving on gastrostomy feeds; for restoration of bowel continuity later.

Case 7.—A female infant 2 days old was admitted on September 18, 1949. She frothed copiously two hours after delivery and her lungs were very wet. All feeds were returned, but there was no cyanosis. The right upper lobe was collapsed, and the bowel contained gas. Blood transfusion and operation were performed, the fistula was closed, and end-to-end anastomosis made. Convalescence was uneventful. Mouth-feeding began on the second post-operative day. The infant is now progressing normally.

Case 8 (Figs. 1 and 2).—A male infant 3 days old was admitted on October 2, 1949. Frothing, regurgitation, and cyanosis had been present since birth. The diagnosis was missed at one hospital owing to the use of a fine catheter, which coiled up in the oesophagus. The lungs were wet, and the abdomen distended with gas. Blood transfusion and operation were performed; the fistula was closed and end-to-end anastomosis performed with difficulty, as the upper segment was short and the gap to be bridged was formidable; nevertheless the lower segment was trimmed back and a satisfactory anastomosis finally achieved. Convalescence was normal. Mouth-feeding was started on the second post-operative day. The infant is now well and is feeding normally.

Case 9.—A female infant, admitted when 7 days old, had vomited every feed since birth. There had been frequent attacks of cyanosis, and frothing was continuous. She was very dehydrated, but the lungs were wet. Admission to hospital had been delayed "because the infant appeared to be moribund." The abdomen was distended. The birth weight was 6 lb. (2.7 kg.), and at the time of operation was 3½ lb. (1.6 kg.). Blood transfusion and operation were performed, with closure of the fistula and end-to-end anastomosis after

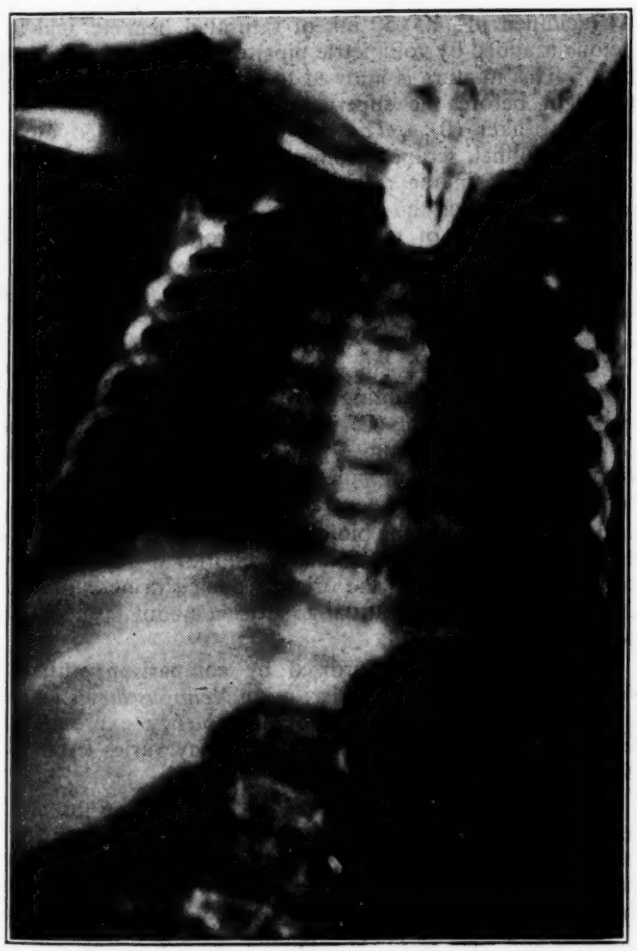

FIG. 1.—Case 8. Pre-operative film showing very short upper segment outlined with lipiodol, and pressure of gas in intestines.

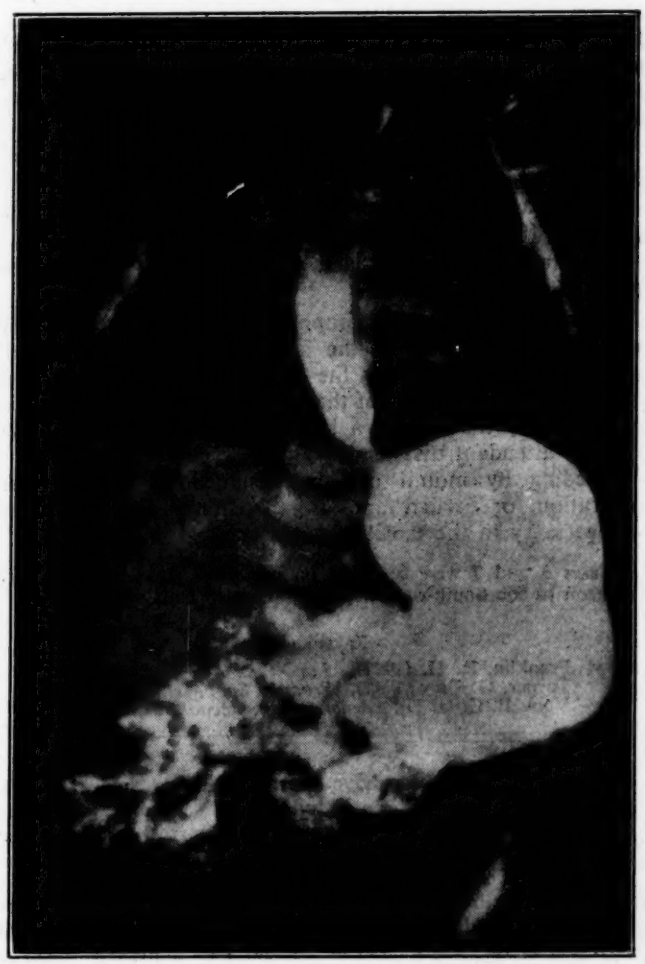

FIG. 2.—Case 8. Barium swallow five weeks after operation.

trimming back the lower segment. Mouth-feeding began on the second post-operative day, and convalescence was uneventful.

Case 10.—A female infant was admitted on February 5, 1950, when 2 days old. Pregnancy had been terminated at 38 weeks owing to severe pre-eclamptic toxaemia. Birth weight: 4 lb. 11 oz. (2.1 kg.); on admission 4 lb. 4 oz. (1.9 kg.). The lungs were wet; there was no cough reflex; and she was cyanosed and frothing. The case had been diagnosed elsewhere as "atelectasis of the left lower lobe," and a tracheal catheter had been passed for aspiration. Mucus aspirated from the pharynx was blood-stained. Blood transfusion and operation were performed; the fistula was closed and end-to-end anastomosis done after trimming back the lower segment. Her post-operative condition was satisfactory at first, but the cough reflex never returned, and she died 12 hours later with atelectasis of both lungs. Both bronchi were full of blood clot and mucus.

Conclusions

Congenital atresia of the oesophagus is commoner than is generally realized, the incidence probably being at least 1 in 800 births. Cases are missed clinically or at necropsy because they are considered to have developed pneumonia or to have atelectasis.

Diagnosis is easy once the condition is suspected. An infant that brings up an undue amount of mucus, particularly as a fine froth, for several hours after birth should be suspected of atresia, and such an infant *should not be fed by mouth until the condition has been excluded.* Diagnosis can easily be confirmed by passage of a medium-sized rubber catheter.

Operation holds out good prospects of cure if these cases are diagnosed early and operated upon promptly. Operation is hardly worth attempting unless there is available an anaesthetist with special experience in connexion with thoracic surgery, and preferably one who has made a special study of anaesthesia in infancy.

Ten cases treated by operation are recorded, five of whom have survived.

Continual aspiration of mucus from the mouth and pharynx, both before and after operation, is necessary.

The transpleural approach has been used in all five successful cases.

Closure of the tracheo-oesophageal fistula and restoration of bowel continuity by the simplest form of one-layer end-to-end anastomosis is the operation of choice. Attention to the blood supply of the lower segment should reduce considerably the risk of a breakdown of the anastomosis and its attendant disasters.

Feeding by mouth can be resumed 24 hours after operation, or earlier, and a gastrostomy appears to be unnecessary in the uncomplicated case.

Cases 3 and 7 were operated on by Mr. J. L. Griffith, second surgeon to the South-west Regional Thoracic Unit.

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Revised salary scales have been agreed for senior nursing staff in general and fever hospitals and sanatoria. The new scales are part of the general review of nurses' salaries which has been proceeding for some time, and they have retrospective effect from February 1, 1949. The new scales cover all senior staff in these hospitals except tutorial grades, which are now being considered by the Nurses and Midwives Whitley Council. The scales for senior staff in mental and maternity hospitals are also under consideration.

REVIEW OF ONE YEAR'S WORK IN WATFORD PREGNANCY DIAGNOSTIC CENTRE

BY

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The Watford Pregnancy Diagnosis Laboratory at Shrodells Hospital, Willow Lane, Watford, was set up in 1949, and was equipped to undertake the Hogben test for pregnancy. This particular test was chosen because it is more reliable, more economical, and more easily adapted for routine work than any other method.

The main requirement for reliable results by the Hogben method is that the test animals (*Xenopus laevis*) are in good condition before being used. The routine followed at Watford is almost identical to that published by Landgrebe and Hobson (1949). When the animals are thought to be suitable they are first tested by the administration of 70 i.u. of chorionic gonadotropin. Only those which respond are used for pregnancy diagnosis. For this purpose a dry stable extract of chorionic gonadotropin was made by a modification of the Katzman and Doisy method (1931).

Preparation of Extract of Chorionic Gonadotropin

All urines yielding a positive Hogben reaction are pooled and filtered the day after receipt. To every litre of urine (A) (acidified *p*H 4.5) 50 ml. of saturated benzoic acid in acetone is added by volumetric pipette with a stirring movement. This mixture is allowed to stand in the refrigerator overnight before the supernatant fluid is decanted into another beaker (B). The dry deposit is collected on a Buchner funnel, scraped from the filter paper, and stored under acetone in the refrigerator. Fluid in beaker B is again processed as the urine (A). The dried deposits are pooled—30 litres of urine yielding from 1.5 to 6 g. of powder.

The powder is extracted with three consecutive amounts of 100 ml. of water. To this slightly acid extract (C) are added 3 volumes of 95% alcohol and 1 volume of ether (diethyl ether); it is then left in the refrigerator for 18 hours. After decanting most of the alcohol and ether the remaining extract (C) is filtered on a small Buchner funnel, washed three times with acetone, dried quickly in warm air, placed in ampoules, sealed off, and stored in the refrigerator.

Before attempting the biological standardization, one can estimate the probable amount of chorionic gonadotropin per mg., assuming that the original pooled urine contained 20 i.u. per ml. (It is usual to extract about 80% of the active material.)

This powder is standardized by comparison with the international standard powder, using *Xenopus laevis* as test animal (Landgrebe, 1948), and its potency expressed in international units per mg. The potency varies from 100 to 400 i.u. per mg.

Number of Tests Undertaken in 1949.—Once the stock of *Xenopus laevis* reached 200 tested animals, urines from Hertfordshire were accepted. Specimens from London and the South of England were taken as the number of tested animals increased. In February, 41 specimens were received, while the peak number handled was 522 in October; 3,724 tests were performed throughout the year.

Technique of Test

The chorionic gonadotropin was extracted from the urine according to Scott's method (1940). Half of the eluted gonadotropin—that is, 2.5 ml.—was injected into one toad; the other half was kept at 2° C. overnight and injected into a second toad if the first had failed to ovulate after 18 hours.

Over a series of 103 specimens it had been noticed that, when two toads were injected with the extract on the same day, only in three cases did one toad ovulate without the other responding. Hence it was decided to inject the second toad only if the first had yielded a negative result after 18 hours. On the evidence obtained from the Pregnancy Diagnostic Centre, Edinburgh, about 50% of our tests would be positive, and we were thus able to increase the possible number of tests undertaken with the same number of test animals by 25%. Table I demonstrates that on 55 occasions out of a total of 1,220 tests the *first injected* toad yielded a false result when "read" at 18 hours, in that it had failed to ovulate until 24 to 48 hours, or failed to ovulate at all, whereas the *second toad*, inoculated with the same extract a day later, yielded a positive result.

TABLE I.—*Demonstrating the Need to Inject a Second Animal When the First Animal Failed to React*

No. of Cases	Delayed or Negative Reaction in Toad I		Positive Reaction in Toad II from Identical Extract
	No Reaction After 48 Hours	Positive Reaction within 18 to 48 Hours	Positive Reaction within 18 Hours
55 (4·5% out of 1,220 tested)	35 (63·6%) 2·86%	20 (36·4%) 1·64%	55 (100%) 4·5%

The recording of delayed positive or false negative results is being continued, as it is thought we may have here a means of evaluating the sensitivity of the animals in our colony.

Distribution of Toad Population in the Tanks.—Negative reactors (A) are placed in tanks (A1) and positive reactors (B) in tanks (B1) until there are 50 animals in each tank. These animals are rested for one month. Toads from tank A1 are used for the fresh tests, and are rested in tank A2 or tank B2. All A3 toads (reacting negatively to three injections) are tested by injection of 70 i.u. of extract. We have had to reject 2.7% of our toads. Thus the subnormally reacting toads are continually being excluded from use. "Positive" toads in B tanks are used regularly for the second injection of a negative Hogben reaction.

An Analysis of the Tests Undertaken

We have recently attempted to encourage the doctors to fill in the data asked for on our request forms by refusing to submit the result of the Hogben test until they return the amended form. We now receive a wealth of information.

In Table II are shown the reasons for which the urines were sent to our laboratory for test.

TABLE II.—*Reasons for Submitting Urine for the 3,724 Hogben Tests Performed*

Clinical Condition	
Abortion	12·6%
Hydatidiform mole	5·7%
Abnormal implanation	1·9%
Tuberculosis (pulmonary)	1·5%
Assumed to be normal pregnancies	39·6%
Menopause	9·3%
Fibroid or tumour	3·2%
Unmarried mother	3·9%
Testicular carcinoma	0·33%
Hormonal amenorrhoea (i.e., obesity, anaemia, etc.)	6·4%
Heart lesions	0·07%
No information given	15·3%
	100·00%

Confirmation of Laboratory Findings

Printed cards, asking whether the Hogben reaction agreed with clinical findings, are posted two months after the Hogben test is carried out. This enables the practitioner to report to us with certainty.

False positive Hogben reactions do not occur. The animal cannot ovulate unless it is injected with the active substance. When, at our request, the doctors were asked to investigate the laboratory's two false positive reports, it was elicited that the patients had concealed their abortion (Table III, D).

TABLE III.—*Interesting Cases*

Group	Evidence			
	Histological Report	Ref.	Hogben Test	Doctors' Confirmation
A. Testicular	Teratoma	557	−	
	Seminoma	562	−	
	Malignant	2,560	+	
B. Pregnancy with menstruation	Confinement May Menstruation August to October	2,159 2,728	+1/10 +1/10	Pregnant
C. Pregnancy with delayed Hogben reaction	L.M.P. 10 weeks	1,099	−	
	,, 12 ,,	1,291	−	
	,, 20 ,,			*X*-ray foetal parts present
	L.M.P. 8 weeks	796	−	
	,, 10 ,,	1,163	−	
	,, 11 5/7 weeks	1,360	+	
	L.M.P. 5 weeks	Edinburgh	−	
	,, 9 ,,	,,	−	
	,, 11 ,,	2,151	+	
D. Pregnancy		891	+	Neg. reinvestigated; patient had aborted
		1,386	+	Neg. reinvestigated; patient had aborted

False negative Hogben reactions may occur when the chorionic gonadotropin in the urine is deficient because the urine has been sent too early, or the urine is not a concentrated specimen—that is, of too low a specific gravity—or if the patient is a poor secretor or excretor, or destruction of the chorionic gonadotropin by an unknown factor has occurred.

Owing to the small number of tests undertaken and to the insufficient confirmatory returns in 1949, figures for the evaluation of the accuracy of the work at Watford will be pooled with this year's results and published in the report for 1950.

Some interesting cases are recorded in Table III. There has been only one case of testicular carcinoma: this we were able to confirm (Group A). Group B represents one patient in whom we were able to allay the fear of malignancy and predict a second conception within three months of delivery of a first baby. The three cases in Group C in which the Hogben test became positive two months after probable conception are examples of failure to send early morning specimens of urine of high specific gravity.

Case of Hydatidiform Mole

This case is recorded (Table IV) by permission of Professor F. J. Browne.

According to dates, this patient was 8 to 10 weeks pregnant when first seen, yet the uterus showed a four-months pregnancy. The uterus failed to increase in size during the four weeks of the investigation.

TABLE IV.—*Hogben Tests in a Case of Hydatidiform Mole*

Pre-operative		Ref. No.	Date	Hogben Result in Dilutions	Friedman Test with C.S.F.
1		3308	28/11/49	+ 1 in 400	
			30/11/49		—
2		4002	1/12/49	+ 1 in 500	
3		4003	7/12/49	+ < 1 in 400	
4		3710	29/12/49	+ 1 in 10	
5		3736	2/1/50	+ 1 in 10	
			3/1/50		+
Operation			4/1/50		
Post-operative	**Hrs. After Operation**				
1	16	4006	5/1/50	+	
2	18	4007	"	+	
3	42	4008	6/1/50	+	
4	45	4010	"	+	
5	56	4011	"	+	
6	62	4012	7/1/50	+	
7	66	4409	"	+	
8	72	4013	"	+	
9	76	4014	"	+	
10	80	4015	"	+	
11	90	4016	8/1/50	+	
12	93	4017	"	+	
13	97	4039	"	+	
14	100	4042	"	+	
15	104	4040	"	+	
16	108	4148	"	+	
17	109	4149	9/1/50	+	
18	114	4150	"	+	
19	123	4151	"	—	
20	138	4041	10/1/50	—	
21	26 days	4258	30/1/50	—	

One millilitre of cerebrospinal fluid was negative to a Friedman test on November 30. A larger volume, 8 ml., injected on January 3, 1950, produced a strongly positive Friedman reaction. It is emphasized that it is *unnecessary to use cerebrospinal fluid* for confirmation of hydatidiform mole. A few years ago, to end the habitual procedure of spinal puncture, the Usher Institute, Edinburgh, refused to accept specimens of cerebrospinal fluid.

Pre-operative urine on December 1 yielded a positive Hogben reaction in a dilution of 1 in 500. Tests repeated 28 and 32 days later reacted only in a dilution of 1 in 10. In view of the lessening of chorionic gonadotropin, the absence of evidence of foetal parts by *x*-ray examination, and the fundus of fourth-month pregnancy it was decided to empty the uterus. This was accomplished by the vaginal route on January 4, 1950.

Twenty specimens of urine were collected in the course of six days, in the hope of detecting the point at which chorionic gonadotropin was no longer being excreted. The test remained positive up to the fifth post-operative day. During this time no specimen caused a reaction in a dilution of 1 in 10. From the sixth post-operative day the test became negative.

Summary

A description is given of the preparation and standardization of chorionic gonadotropin from urine.

The method of using and resting the Watford colony of tested *Xenopus laevis* is recorded.

Some interesting cases are reviewed.

I wish to express gratitude to Dr. F. W. Landgrebe, of the Usher Institute, Edinburgh, for all the helpful interest he has taken in the Watford Pregnancy Diagnostic Centre.

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The Minister of Health recently received a deputation from the Socialist Medical Association, when tuberculosis and its treatment under the National Health Service were discussed. The deputation put forward a number of proposals. The Minister in reply drew attention to the progress already achieved and indicated the lines along which he hoped there would be further advance.

USE OF THE MALE BRITISH TOAD AS A PREGNANCY TEST ANIMAL

BY

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AND

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In the last four years various workers have successfully used male toads of numerous species in the Galli Mainini pregnancy test (Galli Mainini, 1947, 1948; Houssay, 1947). It was decided to investigate the possibility of using the British species (*Bufo bufo*) as a pregnancy test animal.

Method

Two male toads of over 15 g. weight each have 1 ml. of filtered first morning urine injected into the dorsal lymph sac. The toad's cloacal urine is taken at the time of injection and the absence of spermatozoa is checked. Further samples are taken three to six hours later, and the presence of spermatozoa in any of these is regarded as a positive result (see Fig.). If no sperms can be detected in either toad's cloacal urine six hours after injection the result is negative.

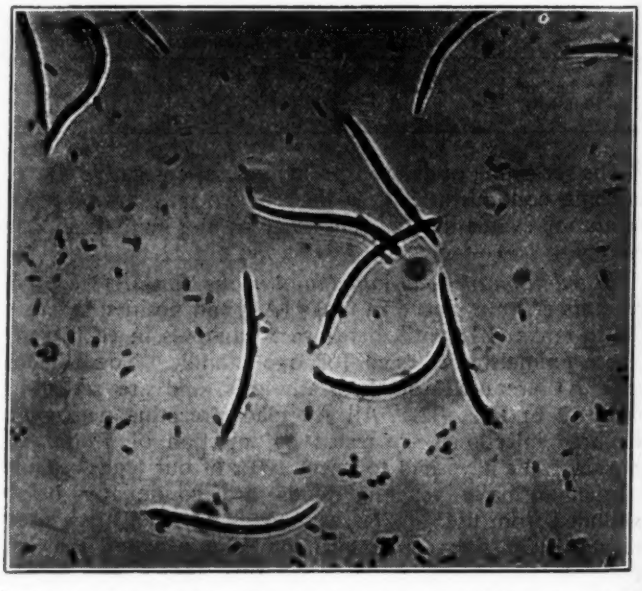

FIG. 1.—Toad spermatozoa (*Bufo bufo*) (× 1,000). The thick black lines are the heads of the sperms, the tails being much finer. The usual debris found in these smears is also present. (Stained Giemsa.)

The toad's urine is collected by means of a fine glass pipette of 1 mm. diameter inserted into the cloaca and moved gently backwards and forwards. This can be examined, unstained, under a low-power microscope (⅔ in.—16 mm.).

Toads can be reused after one week, but no toad should be used for more than four tests, as the reaction is then less prompt, is less pronounced, and sometimes fails altogether.

Results

Eight consecutive tests on 80 pairs of toads gave 53 positive and 27 negative results. Of the 53 positives, 51 were confirmed clinically as pregnancy, one as hydatidiform

mole, and one as a chorionepithelioma of the testis. Of the 27 negatives, 26 were subsequently proved clinically not to be pregnant. The one false negative was an early pregnancy of less than six weeks which a few days later became a threatened abortion.

Discussion

A suitable quantity for injection was 1 ml. of first morning urine, this being the most concentrated specimen of the day. Positives could then be obtained when afternoon specimens gave negative results. Some of Klopper and Frank's (1949) false negatives may be due to this, despite the injection of 2 ml. a toad. Cerquiglini's (1948) injection of 10 ml. a toad is far too much for toads around 20 g. in weight.

The weight of the toads should be over 15 g. This was shown by analysis of the first 25 positive tests (see Table). Of the toads heavier than 15 g. 97% were positive after six hours, while only 75% of the lighter toads were then positive.

TABLE.—*Difference in Response Between Light and Heavy Toads*

Time in Hours	No. of Toads First Giving Positive Result	
	Over 15 g.	15 g. or Less
After 2	24	5
,, 4	7	6
,, 6	2	1
,, 24	1	2
Not in 24	0	2

Pairs of toads are used for every test, and the result is regarded as positive even if only one responds. Thus in our series of 53 positive tests (that is, 106 toads), three toads gave a negative result. With single toads the accuracy would then have been 97%, but the use of pairs brings it to over 99.9%.

In considering the stage of pregnancy after which the toad test becomes positive one has to realize that this, as well as the Aschheim–Zondek, Friedman, and Hogben tests, is essentially a test for gonadotrophins; so the result will depend on the concentration of gonadotrophins excreted in the urine. In normal pregnancy the urinary gonadotrophin level shows a marked rise about the fourth to sixth weeks; before this time it is generally too low for there to be sufficient gonadotrophin in the injection mass to produce a positive result in the various biological pregnancy tests.

As the thresholds of different test animals—mice, rabbits, *Xenopus, Bufo*—are not the same, and as in various tests different amounts of urine are injected, it is obvious that not all of the pregnancy tests will become positive at the same time. It has been tentatively put forward (Frazer and Wohlzogen, 1949), and since confirmed (Frazer and Wohlzogen, 1950), that in the British toad the threshold (ED 50) is about 8 i.u. for standard chorionic gonadotrophin. Despite the results of Bach and Szmuk (1949) on frogs, this threshold in *B. bufo* has not varied significantly at different times of the year in toads kept in a warmed animal-house. Use of the same standard gonadotrophin has shown a threshold for the Friedman test of 15 i.u. approximately; for the Aschheim–Zondek 10 i.u. approximately, and for the *Xenopus* 70 i.u. approximately (Frazer and Wohlzogen, unpublished). With the usual amounts of urine injected in these tests—namely, Friedman 15 ml., Aschheim–Zondek 2 ml., *Xenopus* 7 ml., and *B. bufo* 1 ml.—this means roughly that the gonadotrophin levels above which positive results are obtained with unconcentrated urine will be: Friedman, 1 i.u./ml.; Aschheim–Zondek, 5 i.u./ml.; *B. bufo*, 8 i.u./ml.; and *Xenopus*, 10 i.u./ml.

From this it becomes apparent that the Friedman test will give a positive result earlier in pregnancy than the others. The toad test, however, can be brought up to the same level of sensitivity as the Friedman test by concentrating the urinary gonadotrophins eight times by the method of Scott (1940).

Conclusion

The series of positive results with unconcentrated morning urine were obtained from cases ranging from the fourth week (eight cases) to the seventh month of pregnancy. Over this period there would seem to be no bar to the use of the toad test; but when negative results are obtained in what may be the third to sixth weeks of pregnancy it would be advisable, for 100% accuracy, either to concentrate the urine eightfold or tenfold and repeat the test, or to perform a Friedman test. If neither is feasible the test should be repeated after a fortnight. Which alternative is adopted may depend upon the laboratory facilities available.

Summary

The use of the male British toad (*Bufo bufo*) for pregnancy tests is described. In a series of 80 consecutive cases no false positive and only one false negative result was obtained.

The results are discussed, and suggestions are made for the assessment of the results of pregnancy tests in what may be the first six weeks of pregnancy.

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Medical Memoranda

Inversion of the Uterus

Inversion of the uterus is a very rare condition. The incidence is variously estimated at figures varying between 1 in 16,000 and 1 in 200,000 deliveries. The most searching article on the subject is that written by P. Das (1940). He studied the literature from the earliest times and found records of 391 cases, of which 297 were puerperal. I have found references to a further 122 cases in the journals available to me, while many more are to be found in the *Index Medicus*.

CASE REPORT

The patient, aged 34, was in her fourth pregnancy. Her last menstruation was on October 10, 1946, and her expected date of confinement was July 28, 1947. Her three previous pregnancies had gone to term and her labours had been rapid —the longest three hours. All the children are alive and in good health. Throughout pregnancy she was very well and had no abnormalities of any kind.

Two weeks before her expected date she felt crampy pains which she attributed to indigestion. These persisted for about 24 hours, when they became stronger and were followed by a "show," after which delivery was accomplished in about 50 minutes. The perineum was intact. The third stage was completed in 20 minutes, with a total blood loss of about 10 oz. (284 ml.).

One hour after delivery the uterus was firmly contracted, and as there had been no loss of blood I left the house. The nurse was called away to another case about an hour later. When she left, the uterus was still firm and no bleeding had occurred. About 30 minutes after her departure the patient felt the need to micturate, and having no bedpan raised herself on to the chamber pot. During the act she "felt something come down" in the vagina, and, finding a mass at the vulva, lay down and sent for me.

On arrival about 10 minutes later the inverted fundus was visible at the vulva, the tubal ostia showing clearly. Only slight oozing was occurring from the placental site. Her pulse was 92. The vulva and fundus were liberally swabbed with "dettol" (20%). Vaginal examination confirmed that the uterus was inverted. The loose cuff of the dilated cervix was palpable. The uterus was reinverted by gentle pressure with a sterile pad. Morphine, ¼ gr. (16 mg.), and ergometrine, 0.5 mg., were given and a course of sulphathiazole was ordered. Her pulse rate was now 80.

Throughout the puerperium her temperature did not rise above 98° F. (36.7° C.) nor the pulse rate above 88. The patient was allowed up on the twelfth day and has been free of symptoms since. She carries out her household duties every day.

J. M. B. DONALDSON, M.B., B.A.O., D.Obst.R.C.O.G.

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Acquired Sensitivity to Thiopentone

The following case illustrates how individual requirements for thiopentone can vary from time to time.

CASE REPORT

A woman aged 64 was to be operated on for acute intestinal obstruction. Her general condition was poor, she was ill-nourished, and had been vomiting for 24 hours, though cyanosis and jaundice were not present and she did not look anaemic. Her blood pressure was 180/100 mm. Hg, and pulse 100. Atropine sulphate, 1/100 gr. (0.65 mg.), and morphine sulphate, 1/6 gr. (11 mg.), were given one hour before operation and she was induced with 12 mg. of curare and 0.3 mg. of thiopentone. Slight respiratory depression for about 10 minutes followed this, but no apnoea. Anaesthesia was maintained with cyclopropane and oxygen, and 3 mg. of curare was given after half an hour. A volvulus of the pelvic colon was found and resected, leaving a left inguinal colostomy. The operation lasted 65 minutes, and at the end the patient had completely recovered her cough reflex.

Failure of the colostomy to close necessitated another operation six weeks later. Her general condition had by now greatly improved. Premedication was given as before. After an initial dose of 0.2 g. of thiopentone she became apnoeic, and artificial respiration with oxygen, using a Coxeter-Mushin absorber, was undertaken. The surgeon at this stage commented on the satisfactory relaxation. The absorber was cut out of the circuit periodically lest the washing out of alveolar CO_2 had been serving to maintain the apnoea. After 20 minutes she was intubated orally and the pharynx packed without any sign of resistance from the patient. Later 3 ml. of nikethamide and 1.5 ml. of picrotoxin were given intravenously with no response.

After 50 minutes' apnoea spontaneous respiration began, and at the end of the operation, which lasted one hour, she was breathing normally. Consciousness was regained an hour later, and apart from mild bronchitis she made an uneventful recovery.

COMMENT

The altered response of this patient to thiopentone points to some change having occurred in her detoxicating powers.

Thiopentone detoxication is imperfectly understood (Hewer, 1948), but the drug is believed to be broken down quickly in the tissues generally (Adams, 1944). The role of the liver in this process is very debatable, and, while some hold that it plays a major part (Shideman and Kelly, 1947a, 1947b; Shideman, 1948, 1949; Walker and Wynn-Parry, 1949), Richards and Appel (1941), Lundy (1942), and Scheifley (1946) do not believe that liver damage prolongs thiopentone anaesthesia. Liver and kidney function tests done on the day after the second operation revealed gross dysfunction, and there were persistently high quantities of urobilin in the urine.

The patient was also grossly deficient in vitamin C. While this deficiency prolongs pentobarbitone ("nembutal") narcosis, of which thiopentone is the sulphur analogue, Adriani (1946) denies that it plays any part in the detoxication of thiopentone.

Fears that thiopentone administration might have a deleterious effect on patients undergoing sulphonamide therapy were abandoned after the experience gained in the last war (Adams, 1944). Nevertheless, it may be mentioned that in my case 21 g. of sulphadiazine had been administered two weeks previous to the second operation, and that a course of succinylsulphathiazole was started 24 hours before it. The precise bearing of this on the course of events is a matter for speculation.

Shortly before her discharge from hospital the patient informed us of her intention to resume the "injections for the blood," which she had been having thrice weekly prior to admission. Blood examination at that time showed: red cells, 1,430,000; white cells, 2,000; Hb, 40%; the stained film being typical of pernicious anaemia. Her first operation being a night emergency, no pre-operative blood examination was feasible, and her satisfactory post-operative course gave no indication for haematological investigation.

On incubating thiopentone with blood at body temperature, Richards (1947a, 1947b) found a decrease in potency which did not occur when plasma was substituted for whole blood. This suggests that some enzyme in the red cells is capable of detoxicating thiopentone. In my case the deficiency in the red cells due to anaemia at the time of the second anaesthetic would mean loss of this enzyme and could account, at least in part, for the altered response to the drug.

Liver deficiency could have been secondary to the gross degree of anaemia that developed during the six weeks' abstinence from liver extract, and could have been a manifestation of anoxia. Thus the "acquired sensitivity" to thiopentone can be attributed to a combination of gross anaemia and liver damage.

I am indebted to Mr. A. M. Abrahams and Dr. J. B. Hargreaves for permission to publish this case, and I would be interested to hear of any similar cases.

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Reviews

TUMOUR FORMATION

Studies on Tumour Formation. By the late G. W. deP. Nicholson, M.A., M.B., B.Ch. (Pp. 637; 183 figures. 63s.) London: Butterworth. 1950.

Between 1921 and 1938 the late Professor G. W. Nicholson wrote a series of articles on tumour formation for the *Guy's Hospital Reports.* These are collected together and published in chronological sequence in this volume, which, as Professor R. A. Willis says in the foreword, "is a fitting memorial to a great man who was too little known in his lifetime."

It is regrettable that Nicholson's published work was not more widely read in his lifetime. This was to a large extent due to his strong aversion to the public exposition of his views and his disinclination to oversimplify his writings. His literary style was entirely his own, and this volume carries so deep and accurate an impression of his personality that, in order to give the prospective reader some idea of the scope and quality of the work, it is necessary to say something of the author himself.

Nicholson was first and foremost a general biologist with a passionate interest in microscopic structure and the broad problems of growth and development. With this background he was led, in the genial atmosphere of the Guy's Medical School, to the study of tumour formation, and to this problem he unselfishly devoted his life and energies. Others have followed or are following this trail, but Nicholson's writings and teaching had a unique quality which was to a large extent the outcome of his early training in the humanities. He brought to the study of biology the fruits of an arduous Continental schooling in the classics and a long period of rigid training in formal logic and Germanic philosophy. As he reached maturity and his experience of the structure and behaviour of tumours ripened, his deductions were the outcome of intellectual integrity, an uncommon degree of independence and impartiality of thought, and fierce intolerance of dogma which provoked him in his published work to outspoken and almost pungent criticism.

Although the last chapter of this volume was published twelve years ago, Nicholson's deductions with regard to the fundamental nature of tumour formation have not been outdated by modern discoveries. Close analysis of his evidence led him to believe that in structure, function, and manner of growth tumours "do not differ essentially from other tissues and obey the laws of growth that govern their behaviour." With regard to causation, he concluded that two basic factors were concerned—an external stimulus (factor of realization), and an intrinsic cellular reaction, which he concluded must be "essentially natural, biological, and entirely physiological." He was not greatly concerned with the external stimulus, the carcinogen, or, as he called it, the "cause of cancer in the medical sense." He believed that we understand as much about this aspect of causation as we do about infection. He was almost entirely preoccupied with the living reacting cell, and the growing modern tendency to investigate the biochemistry of the growing cell supports his belief.

Of the twenty chapters in the book six deal with specific but debatable subjects in tumour pathology, such as the hypernephromata, the mixed tumours, the teratomata, and the heterotopic tumours. In each case, although the basic significance of observed structure is fully examined, the tumour in question is used to illustrate general principles or to stress the futility of some theory or hypothesis which professes to "explain" its origin. The hypotheses of Cohnheim, Grawitz, and Wilms are dealt with in turn, gently at first, then with a gradually rising crescendo of less and less restrained criticism.

The remaining chapters are on the application of biological principles to the general pathology of tumour formation, and of these Chapter XI (Causation : Reaction and Environment), Chapter XIII (Somatic Development and Tumour Formation), and Chapter XX (Induction and Determination) should be read by every serious student of the subject.

To read this book demands patience and concentration. As the author's arguments are unfolded the reader is likely to meet with some rude shocks to one or other of his cherished beliefs. He may sometimes be annoyed, but he will far more often be amused. He will certainly be made to think, and it is very probable that he will never again say that "tumours are autonomous."

GEOFFREY HADFIELD.

TEXTBOOK OF RADIOTHERAPY

A Short Textbook of Radiotherapy for Technicians and Students. With a supplementary Chapter for the Dermatologist. By J. Walter, M.A., B.M., M.R.C.P., D.M.R.E., and H. Miller, M.A., Ph.D., F.Inst.P. Foreword by J. L. A. Grant, *M.C.*, F.R.C.S.Ed., F.F.R., D.M.R.E. (Pp. 444; 199 illustrations. £1 8s.) London: J. and A. Churchill. 1950.

When a book covers the intricacies of modern physics, deals with cancer from a medical point of view, and is on a subject, radiotherapy, which many doctors shy away from, it is clearly a delicate task to be lucid for girls of School Certificate standard who will have to use the book for technical examinations. This book is written for radiographers and student radiographers, and whether the authors have succeeded entirely in their aim cannot be easily decided by anyone familiar with the technical terms. For instance, will the average radiographer be confused by two different applications of the word "normal" occurring on the same page? Only the reader for whom it is designed can answer these questions properly. In the opinion of the reviewer the authors have succeeded admirably in their aim and, moreover, produced a book which will serve for medical students as an introduction to a subject which is something of a mystery to them. Physics, radium, radon, and high-voltage radiation, together with super-voltage apparatus and radioactive isotopes, are some of the non-biological ingredients, while accounts of theories of cancer development, spread of cancer, biological action of radiation, and effects of *x*-ray treatment are some of the biological ingredients. The fruit of the cake consists of accounts of various diseases coming within the scope of radiotherapy and of the methods employed in dealing with them, together with a section on protection from radiation. The whole is liberally decorated with diagrams and photographs which are clear in their application, and the last two-thirds is spiced with quotations and footnotes which show the derivation of some medical words.

Inevitably the readers for whom it is intended are destined to suffer from some mental indigestion, but the authors have done well in making the cake appetising and attractive, considering all the ingredients necessitated by the examinations which radiographers must take in therapy. Any radiotherapist could criticize some points, but all will agree that it fills well a need for which no other book is available.

FRANK ELLIS.

A GREAT WORKER IN PUBLIC HEALTH

Selected Papers of Haven Emerson, A.M., M.D., D.S.M. Published on the occasion of his 75th birthday, October 19, 1949, by the W. K. Kellogg Foundation, Battle Creek, Michigan. (Pp. 507. $3.)

On October 19, 1949, Haven Emerson, one of America's greatest practitioners of public health, celebrated his 75th birthday. The occasion was marked by the most sincere expressions of appreciation from his many friends and colleagues and by the publication of thirty-five well-selected papers from more than one hundred and fifty written by him during his long life.

He is not the first great worker in the field of public health to have forsaken a most promising career as a physician for the less obvious attractions of preventive medicine and to have distinguished himself subsequently in epidemiology and medical administration. His rarity lies not only in his clear and able scientific work but in his constant awareness of its deeper social significance.

This book can be recommended to readers in Britain on three accounts. First, such papers as that on "The Prevention of Heart Disease" and "The Place of Mental Hygiene in the Public Health Movement" are as worthy of study now as when they were written. Secondly, many papers are concerned with the relation to each other of voluntary and official bodies and their proper place in the promotion of community health. These are the considered opinions of a man of great intelligence and experience, and should be closely examined at this critical time in the development of our health services. Thirdly, those interested in the growth to maturity of the human personality will find fascination in the study of these papers, taken as they are chronologically, and representative of the main stages in the life of an outstanding man.

J. M. MACKINTOSH.

ASPECTS OF UROLOGY

Essential Urology. By Fletcher H. Colby, M.D. (Pp. 580; 342 figures. £3 1s. 6d.) London: Baillière, Tindall and Cox. 1950.

The title of this work is apt to mislead. To most people the essentials of any specialty are those broad principles which should guide the medical man in his practice of it and should form a sound basis for diagnosis and treatment. But in this work the emphasis is on the embryology, anatomy, physiology, and pathology of the genito-urinary organs. The author considers that methods of treatment change so rapidly and are so soon out of date that it is difficult to include them in a book meant primarily for students. But, although he does not claim that this book is a comprehensive work on genito-urinary surgery, and discusses treatment only secondarily, he throws light on many of the practical problems with which the genito-urinary surgeon is concerned. For example, the book includes an excellent table which allows the reader to see at a glance the respective advantages and disadvantages of the various methods of carrying out prostatectomy. It also gives statistical data by which the mortality rate, and therefore the risks attached to these operations, can be assessed. The book can therefore be looked upon as being an excellent means of supplementing other reading on this subject. It can claim to deal with essentials in so far as anatomy, physiology, and pathology are the foundation subjects on which all surgery rests. Like almost all medical works coming from the U.S.A., this book is very well illustrated.

KENNETH WALKER.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

Human Sex Anatomy. By R. L. Dickinson, M.D., F.A.C.S. 2nd ed. (Pp. 145. 76s. 6d.) London: Baillière, Tindall and Cox. 1949.

Domestic Science and Dietetics. Choice of Careers: New Series No. 13. (Pp. 40. 9d.) London: H.M.S.O. 1950.

Manual of British Water Supply Practice. Compiled by the Institution of Water Engineers. Edited by A. T. Hobbs, M.I.C.E., and J. E. Hobbs. (Pp. 910. 50s.) Cambridge: Heffer. 1950.

Vision: Its Development in Infant and Child. By A. Gesell, M.D., and others. (Pp. 329. 42s.) London: Hamish Hamilton. 1949.

Transactions of the American Goiter Association, 1949. (Pp. 460. 77s. 6d.) Oxford: Blackwell Scientific Publications. N.D.

Cytologic Diagnosis of Lung Cancer. By S. M. Farber, M.D., and others. (Pp. 80. 45s.) Oxford: Blackwell Scientific Publications. 1950.

Lip Reading. By J. H. Burchett. (Pp. 192. 6s. 6d.) London: National Institute for the Deaf. 1950.

Communicable Diseases. Edited by R. L. Pullen, A.B., M.D., F.A.C.P. (Pp. 1,035. 140s.) London: Henry Kimpton. 1950.

A Manual of Bandaging, Strapping, and Splinting. By A. Thorndike, jun., M.D. 2nd ed. (Pp. 148. 14s.) London: Henry Kimpton. 1950.

Feeding Mothers and Babies. By N. Heaton and G. Daynes, M.R.C.S., L.R.C.P., D.C.H. (Pp. 214. 7s. 6d.) London: Faber. 1950.

Psychic Pitfalls. By S. Desmond. 2nd ed. (Pp. 271. 15s.) London: Rider. 1950.

Food Poisoning. By E. B. Dewberry, M.B.E. (Pp. 318. 17s. 6d.) London: Leonard Hill. 1950.

Manual of Massage and Movements. By E. M. Prosser, T.M.M.G. 3rd ed. (Pp. 388. 15s.) London: Faber. 1950.

Cerebral Angiography. By P. A. Lima. (Pp. 221. 45s.) London: Geoffrey Cumberlege. 1950.

Practical Post-Mortem Technique. By E. G. Poynter, R.M.P., S.E.A.N. Edited by L. L. Griffiths, M.A., M.D., B.Ch., B.A.O., D.P.H. (Pp. 118. 9s.) London: Henry Kimpton. 1950.

General Clinical Counseling in Educational Institutions. By M. E. Hahn and M. S. MacLean. (Pp. 375. 30s.) New York, Toronto, London: McGraw-Hill Book Company. 1950.

Some Relations between Vision and Audition. By J. D. Harris, Ph.D. (Pp. 56. 11s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

The Cerebral Circulation in Health and Disease. By C. F. Schmidt, A.B., M.D. (Pp. 78. 15s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

Simmonds's Disease. By R. F. Farquharson, M.B., F.R.C.P.C. (Pp. 93. 15s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

The Use of Chemical Tests for Alcohol in Traffic Law Enforcement. By G. C. Forrester, Ph.D. (Pp. 91. 15s.) Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950.

Atlas of Human Anatomy, Descriptive and Regional. By M. W. Woerdeman, M.D., F.R.N.A.Sc. Vol. 2. (Pp. 642. 63s.) London: Butterworth. Amsterdam: Wetenschappelijke Uitgeverijnv. 1950.

Gedenkboek der Koninklijke Nederlandsche Maatschappij tot Bevordering der Geneeskunst. (Pp. 308. No price.) Amsterdam: De Bussy. 1949.

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THE CAUSES OF DELINQUENCY

In the opening pages of this issue we publish the memorandum submitted to the Royal Commission on Capital Punishment by Sir David Henderson, who from his great experience suggests certain lines of treatment for "sick society." Sir David, like many others, thinks that the state of uncertainty and insecurity in which people live is an important cause of the prevalent emotional instability. Certainly the post-war increase in juvenile delinquency, to which we have already referred once before this year,[1] has disturbed public opinion and has led to a number of investigations, published and unpublished, into its possible causes. Of these the most elaborate and most recent is that carried out by Mr. D. H. Stott with the assistance of the Carnegie United Kingdom Trust.[2] His plan was to take up residence at an approved school as an apparent member of the staff and to make an intensive study of 100 youths during the time that each remained at the school. The age of his subjects varied from 15 to 18 years, and their ability from that of a high-grade defective to that of an average grammar-school pupil. The majority were persistent offenders and had made at least "three previous court appearances." Stott's method was to collect all available information about the previous history of each youth and about the conditions prevailing in his home, and then to amass detailed records, for the most part in non-technical language, by means of interviews, unobtrusive observation, and reports from his colleagues on the staff. His results are presented in the shape of informal case-histories; and a bird's-eye view is given in one huge frequency table, showing how often each important feature was noted in each individual. The raw material, including as it does numerous verbatim records, constitutes an unusually valuable mine of data for the patient reader, but it might perhaps have gained a little in intelligibility had the details been arranged or classified in accordance with some regular scheme. Stott discards "psychiatric categories" and dispenses with psychological tests, except for a preliminary application of the matrix test of intelligence. He defends his procedure by contending that "a delinquent act is not a fortuitous episode, but the outcome of many emotional cross-currents, which can only be demonstrated by a full and continuous description of each case." The conclusion which he finally reaches is that "delinquent breakdown is an escape from an emotional situation which (for the particular individual with the various conditionings of his background) becomes, temporarily at least, unbearable." This intolerable emotional situation arises almost always within the lad's own home and "centres round his relationships with his parents."

Within this general picture Stott found it possible to distinguish five main motives for juvenile crime. The most frequent, present in more than half his cases, is that which he calls "avoidance-excitement"—"the lad throws himself into a round of escapades to keep at bay an anxiety too poignant to be faced." The second, almost equally common, is "spite or retaliation," usually directed against the parents. In nearly half the cases he discerned a third "co-operating motive"—an attempt, often quite deliberate, to secure removal from home. In a smaller number of cases the delinquent behaviour began as a somewhat perverse method of attracting the notice of unaffectionate parents and "testing their loyalty." The last motive, found in about one case in five, was that of "compensating for inferiority." His classification, it may be noted, is based on types of reaction rather than on types of person, and the author's insistence on this is one of the most welcome features of this report. As so many investigators have emphasized, delinquency, like other forms of maladjustment, is to be explained not in terms of any simple cause, such as heredity, innate constitution, or economic or social handicaps, but rather as the result of a prolonged dynamic interaction between an individual personality on the one hand and environmental circumstances on the other. This insistence on the complexity of the causes of delinquency comes out clearly in his discussion of the influence of the cinema. Stott notes that film-going, as the most readily available channel for what he terms "avoidance-excitement," provided the favourite form of entertainment for nearly all the youths he had under observation. It is from the cinema that they have obtained the chief means of "emotional education." Sometimes its influence has proved beneficial, since it can "perform the function of catharsis, and at the same time keep them out of mischief." The worst that can be said of "the gangster and the gay-life film" is that it sets a low standard of social behaviour and may occasionally "determine the form of the delinquent breakdown." It is interesting to note that much the same conclusion has been reached by the recent inquiries among delinquent youths carried out by the Departmental Committee on Children and the Cinema.[3]

If any one cause is to be singled out as all-important, Stott believes it is the conditions in the home. "The problem of delinquency is in great measure the problem of the unsatisfactory family." However, before his

[1] Leading article in the *British Medical Journal*, 1950, 1, 590.
[2] *Delinquency and Human Nature*, Carnegie United Kingdom Trust, 1950.
[3] *Report of the Departmental Committee on Children and the Cinema*, 1950, London: H.M.S.O.

wider generalizations are accepted, two limitations in his survey must be borne in mind. First, the youths who provided the material for his study can scarcely be regarded as forming a random or typical sample of juvenile offenders. Those committed to an approved school are a specially selected group. "The vast majority of the boys," Stott writes, "had been removed from their homes as a measure of despair." It is therefore not surprising to find that in almost every one of his cases a dominant part was played by the unsatisfactory home conditions and lack of adequate parental care and discipline. Secondly, it is not known how frequently the same kind of conditions prevail among law-abiding youths drawn from the same social classes. In planning his investigation Stott decided to dispense with what he calls "the standard modern technique" of comparing a typical sample of the delinquent population with a parallel sample of non-delinquents. This omission he defends by insisting on "the probable inconclusiveness of the control-group technique": of itself, he says, it cannot directly reveal the line of causation. That may be true; but the inclusion of a control group can certainly help to verify inferences about the probable nature of causes deduced on other grounds. Every psychological observer can cite instances in which non-delinquent youngsters have been brought up in homes where the emotional situation has become intolerable. Many react not by delinquency but by neurotic breakdown. As Sir David Henderson states in his memorandum, "the conflict which produces criminal acts in the case of delinquents is very much the same type as that which produces psychoneuroses." It seems very probable, therefore, that some additional condition may be present, either in the boy or in his social circumstances, which leads to a breakdown in some cases and not in others, and which, in a certain proportion of the former, causes that breakdown to assume the form of criminal outbreaks.

Stott considers that many of his cases, judged by present-day psychiatric standards, would probably be diagnosed by medical investigators as "psychopathic personalities." Sir David Henderson considers that the individuals in this group are a most serious problem, but Stott believes that the label "psychopathic personality" is apt to be misleading. He cites instances in which the diagnoses offered by psychiatrists contradicted each other or in which their prognoses were not borne out by the after history of his cases, and he deprecates the tendency of current psychiatric teaching to encourage the "psychologically minded parent" to suppose that the inevitable naughtiness of his child may be symptomatic of some incipient "mental abnormality." He believes that all this results from the fact that "some schools of psychology have yielded to the temptation of generalizing wholesale from the pathological to the normal." We ought, he argues, to begin with the study of the normal mind before we turn to the delinquent. The prevalence of crime is sufficient evidence of the unsatisfactory condition of the psychology of crime, and this, in his opinion, is due not so much to any intrinsic difficulty of the subject but to "that disease of modern psychology—the classic separation between theory and practice." On the one hand, there is the psychiatrist daily engaged in clinical work, working with "concepts of a crude pre-scientific character"; on the other, the academic psychologist, "well versed in general principles and the methodology of research," but engaged on little else but intelligence testing. The cure is for theorist and practitioner to come together, each profiting by the experience of the other. Stott concludes his report with suggestions for future research. In the past the most substantial contributions to the study of delinquency have been made by those psychologists who were in a position to combine the statistical method with the case-study method. His own inquiries have admirably demonstrated the value of the case-study method. But, as he himself points out, "the total number of cases so studied remains insufficient to demonstrate any convincing association," and what is now most urgently needed is a broader co-operative inquiry, using both the theoretical and the practical approach, and extensive enough to permit "a statistical validation of the hypotheses already advanced."

PUBLIC HEALTH DISPUTE

The negotiations on revised salary scales, which have been conducted through Whitley machinery for the last four months, have broken down, and the matter has been referred to arbitration. Discussions began on March 16, public health medical officers being represented by the staff side of Committee C of the Medical Whitley Functional Council under the chairmanship of Dr. Metcalfe Brown. The management side comprises representatives of the associations of local authorities, and an observer from the Ministry of Health and from the Department of Health for Scotland.

The new salary scales were first formulated over eighteen months ago.[1] Under them the range of maximum salaries for medical officers of health varies from £2,400 a year where the population does not exceed 100,000 to £3,600 where the population exceeds 750,000. Senior medical officers who are in charge of services or departments such as school-health and mental-health services would receive maximum salaries, also related to size of population, ranging from £2,160 to £2,520. These salary scales were formulated in terms of the 1939 value of money and include a betterment factor of 20%, which has not been finally agreed.

[1] *British Medical Journal Supplement*, 1949, 1, 45.

The management side of the Whitley Council has countered these claims with proposals of its own. The arithmetical difference between the claims of the two sides is not known, but agreement has not been obtained. On July 24 the staff side therefore intimated their desire to refer the matter to arbitration, and the management side concurred. The dispute will be reported to the Ministry of Labour for reference to the industrial court under the Industrial Courts Act of 1919. A satisfactory feature of the conflict is that resort to arbitration has been agreed by the two sides and has not been demanded by one alone, as it could be under the National Arbitration Tribunal (Defence) Regulations of 1940. The terms in which the dispute will be taken to the industrial court have not yet been agreed between the two parties, but presumably the court's decision will be binding on both.

The necessity for more attractive salary scales for medical officers in the public health service has become increasingly obvious since the Health Service started. Medical men and women now take up public health work with a reluctance that is bound to be detrimental to the efficiency and development of the country's preventive medical services. Again, the Health Service has provided opportunities for remuneration which, though unsatisfactory to many, yet seem attractive to the absurdly underpaid workers in the public health services. The "wage freeze" still remains the Government's policy, but clearly it cannot be allowed to jeopardize the safety of the country's health. Whatever view the industrial court may take—and comment would be out of place, for the matter is now *sub judice*—the Government cannot allow the present drift away from public health work to continue.

THE MEDICAL ACT, 1950

The Medical Act, 1950, received the Royal Assent on July 28. The main purpose of the Bill, which was first considered in the House of Lords on April 18, was to give effect to the Government's acceptance of certain recommendations put forward by Sir William Goodenough's Committee in 1944. The General Medical Council in the first instance drafted a non-controversial Bill which provided for the "intern year" and for a number of amendments to its own disciplinary procedure. The two most important changes proposed were the establishment of a disciplinary committee and the granting of the right of appeal. It was generally felt that the opportunity might be taken to introduce further changes, so the British Medical Association, the Medical Defence Union, and the other defence societies prepared in 1947 recommendations for submission to the G.M.C. A number of conferences followed, and the draft Bill was passed to the Ministry of Health. There were prolonged and useful discussions between representatives of the Ministry, the Association, and the defence societies. The draft Bill as finally revised then had to wait some months before there was a prospect of legislation. When it did reach the House of Lords a number of constructive amendments were adopted. Lord Addison introduced the Bill, and valuable contributions were made by his noble colleagues to the debates on the Second Reading, in Committee, and on the report stage.[1] In the House of Commons[2] the Minister of Health was open to argument, and the medical members there effected other amendments and obtained a number of important assurances. The Bill was entirely a non-party measure, and both medical Lords and medical Members of Parliament showed their anxiety to improve the standards of medical education and to fortify the General Medical Council in its disciplinary functions.

In its first six clauses the Act provides for the "Goodenough year." After securing a registrable qualification a student will be obliged, from a day to be appointed, to spend a period to be prescribed in a resident appointment at an approved hospital or institution.

It will probably be a year, or even two years, before an "appointed day" can be set with the assurance that there will be places available for every medical student who qualifies. The period to be prescribed, probably 12 months as it was in the original Bill, is now to be decided by the G.M.C., subject to the approval of the Privy Council. Once these points have been settled the newly qualified man or woman must first of all seek and obtain an appointment. He or she has then to submit to the Registrar of the G.M.C. evidence of appointment, evidence of qualification—and five guineas—to secure "provisional registration." Full registration will follow on presenting to the Registrar a certificate of satisfactory service duly completed—and six guineas. Until the newly qualified are fully registered they will not be at liberty to practise other than in an "approved appointment." Subject to certain safeguards, approved appointments may at some future date include appointments at suitable health centres. These appointments are intended to be an extension of the period of medical education, though they will carry a rate of remuneration of £350 a year for the first six months and £400 a year for the second six months. The scope of the work that can be undertaken by a provisionally registered practitioner will depend on rules to be laid down by the Privy Council. It is anticipated that anyone provisionally registered will be authorized to sign death certificates and to prescribe dangerous drugs. Reciprocal arrangements with the Republic of Ireland have been negotiated, and it seems that similar arrangements may be made with, for example, New South Wales, the Union of South Africa, and other countries.

[1] *British Medical Journal*, April 29, 1950, p. 1011; May 13, p. 1146; May 27, p. 1275.
[2] Ibid., July 8, 1950, p. 112; July 22, p. 223; July 29, p. 302.
[3] Ibid., 1949, 1, 1144.

New powers have now been given to the G.M.C. to inspect the medical tuition afforded to students at medical schools. This, too, is in accordance with the recommendations of the Goodenough Committee. Hitherto the Council has only had power to "listen in" at examinations. The visitors appointed for this purpose are expected to work harmoniously with the visitors who conduct an inspection of hospitals from time to time on behalf of the University authorities. In this way the G.M.C. will exercise a closer supervision over the work and instruction of medical students.

In 1945 the Representative Body adopted a motion by Hendon that it was necessary to examine and report on the composition and procedure of the G.M.C. The new Act does increase the number of directly elected representatives. The present Council consists of 39 members, including seven elected by the rank and file of the profession. The remainder are the nominees of the Privy Council, the Universities, the Royal Colleges (now including the Royal College of Obstetricians and Gynaecologists), and the Licensing Corporations. The new Council is to have 11 elected members—an increase of four—out of a total of 47. It is now obligatory to appoint three lay members. Lay members will not receive any fees but will be granted the usual travelling and other expenses. This gets over the difficulty of lay members who are M.P.s holding offices of profit under the Crown.

The disciplinary machinery of the G.M.C. has often been criticized by the legal profession and by doctors. The medical defence societies have long had prepared a whole series of recommendations for the improvement of this machinery. Not all their proposals have been accepted, but some of the more important ones are incorporated in the Act, and others are likely to find their way into the new Rules of Procedure. In future, complaints will in the main be the subject of a statutory declaration. The Ministry of Health still reserves its right in certain special circumstances to inform the G.M.C. of the facts disclosed at an inquiry under the National Health Service Acts. The Minister, however, has given an undertaking that when a doctor is acquitted by the Tribunal no documents on the case will be sent to the G.M.C. Witnesses can be subpoenaed in future, and to them, as to others giving evidence, the oath may be administered. Doctors, and others, will be entitled to be legally or otherwise represented if they so choose. The new Disciplinary Committee is to consist of 18 members and the President, though for most cases only nine members will sit. Six of the 18 and two of the nine acting in this capacity are to be directly elected members; five will form a quorum. Only a simple majority is required for any decision (which might mean a majority of three to two), and a respondent, when a charge is not proved, is now entitled to a verdict of "Not Guilty." The Disciplinary Committee is to sit with a legal assessor, and if he gives any ruling the parties to the case are entitled to be made aware of that ruling. Any member of the Council (except the President) who takes part in a preliminary review of a case by the Penal Cases Committee is precluded from serving on the Disciplinary Committee when that same case is under inquiry. Most important of all, there will in future be an appeal from a decision of the G.M.C. to erase the name of a practitioner from the *Register*. This appeal will be to the Judicial Committee of the Privy Council and must be entered within 28 days. The G.M.C. may appear as a respondent, and the appeal can rest on points of law or on points of fact.

There is a minor though important provision raising from £20 to £500 the fine that may be imposed, under Section 40 of the Medical Act, 1858, on a person who wilfully and falsely holds himself out to be a registered medical practitioner. In this regard it may be said that the clarification of the law suggested by the Lord Chief Justice in the Lufting case[3] has not been effected. In general, however, though not all that has been sought has been conceded, the Medical Act, 1950, makes a number of substantial and welcome changes. In future the G.M.C. will be possessed of wider powers, improved machinery, and a better status, all serving to ensure the continued and enhanced confidence of the profession and the public alike.

VARICOSE ULCERATION

A condition such as varicose ulceration, the incidence of which in Great Britain has been estimated to be in the region of five per thousand of the population,[1] certainly merits the most serious and conscientious attention of general practitioners and surgeons alike. Knowledge of the aetiology of this condition and sound understanding of the proper methods of treatment have been slowly and painfully acquired, and gradual progress has been made. The underlying mechanism of varicose ulceration is certainly more complex than was formerly believed, and sometimes exponents of one or other theory and practice have been guilty of over-simplification of this problem. It is true to say that few things are either as good or as bad as they at first seem, and this is a valid comment on many of the methods of operative treatment of this condition which have gradually come into vogue.

Few with experience of this problem will now dispute that most cases of so-called varicose ulceration are due to a previous deep venous thrombosis. For this reason it should be obvious that the prevention and early treatment of cases of deep thrombosis are of the greatest importance, and in this direction surgeons have made much progress, though it would be rash to suggest that the thrombosis problem is near to solution. It is at least possible that a few of the most recently introduced measures, and especially the sometimes indiscriminate use of deep-vein ligation in cases of acute thrombosis, may lead to later leg troubles, but it would take ten years or more to justify such a prediction.

During the last few years the increasing use of phlebographic investigation of the veins of the legs, and the less

extensive practice of venous-pressure studies, have modified some earlier conceptions of valvular damage in the deep vessels. There is now ample evidence of the serious structural damage which a deep thrombosis may inflict, and the regurgitant venous flow which results from valvular incompetence in the deep veins has been clearly demonstrated. Homans[2] first suggested the use of femoral- and iliac-vein interruption in these cases, and several other surgeons have undertaken careful studies of femoral-vein ligation.[3-7] It has been difficult to assess the true value of these procedures, for no properly controlled trial has been described which will enable an independent and more sceptical observer to judge the importance of the many accessory influences to which such cases have been subjected. Mahorner,[8] writing from great experience, has expressed strong doubts about some of the reported results of vein ligation.

Failure to relieve the ulceration and related symptoms by superficial femoral-vein ligation can in certain cases be ascribed to the presence of other incompetent main channels and to tributaries which continue to "feed" the ligated vessel at a lower level. In a paper which he read at the recent Annual Meeting of the B.M.A. at Liverpool and which is published in this issue, Dr. Gunnar Bauer discusses this problem and makes the reasonable suggestion that the main vessels should be divided in the popliteal region, where by-passing can less readily occur. Though this seems a logical step, it might be wise to add that there is perhaps some danger of being a little too logical and of regarding this as simply a mechanical and hydrostatic problem. With earlier experiences of femoral-vein ligation before us it would be altogether premature to try to assess the value of this new operation so soon. In one respect at least popliteal-vein ligation offers special advantage, for it seems to provide immediate relief from the distressing bursting pain of which many patients complain. This type of pain is, however, often relieved by the support given by an efficient bandage, and it would be wise to try the effect of a well-applied bandage before deciding to tie the popliteal vein. Dr. Bauer mentions a test of femoral-vein incompetence which can be performed on the operating table, but it should be remembered that in the resting patient the pressure in a dependent vein, whether normal or abnormal, will represent the hydrostatic pressure exerted by a column of blood extending up to heart level. The measurement of pressure in the popliteal vein on the operating table is therefore of doubtful significance. On the other hand, White and Warren[9] have shown the value of the walking venous-pressure test, and Walker[10] has confirmed their observations on patients with the syndrome of lower-leg stasis. Dr. Bauer, who has done much to advance knowledge of early thrombotic processes, rightly regards the operation of popliteal-vein ligation as merely one weapon to be used in concert with other methods; it does not supersede the well-tried and more conservative forms of treatment.

Popliteal-vein ligation should be submitted to a fully controlled investigation in this country, and surgeons who are too busy to study their results, or unable to provide their patients with adequate supporting bandages and detailed aftercare, should not in the meantime be tempted to use it indiscriminately. The proper application of supporting bandages is a technique which not many have mastered, but one which brings the patient great benefit. At the discussion which took place after Dr. Bauer had presented his paper Mr. Dickson Wright referred to the need for a missionary zeal in dealing with cases of varicose ulceration. This advice, from one who has for many years emphasized the benefits of a more conservative regime than is sometimes practised to-day, should be heeded.

[1] Oldham, J. B., at the meeting of the Section of Surgery, Annual Meeting of the B.M.A., Liverpool, 1950. Reported in the *British Medical Journal*, 1950, **2**, 269.
[2] *New Engl. J. Med.*, 1941, **224**, 179.
[3] Buxton, R. W., Farris, J. M., Moyer, C. A., and Coller, F. A., *Surgery*, 1944, **15**, 749.
[4] Buxton, R. W., and Coller, F. A., ibid., 1945, **18**, 663.
[5] Glasser, S. T., *Surg. Gynec. Obstet.*, 1949, **89**, 541.
[6] Linton, R. R., and Hardy, I. B., *Surg. Clin. N. Amer.*, 1947, **27**, 1171.
[7] ——— ——— *Surgery*, 1948, **24**, 452.
[8] *Surg. Gynec. Obstet.*, 1949, **88**, 115.
[9] *Surgery*, 1949, **26**, 987.
[10] At the meeting of the Section of Surgery, Annual Meeting of the B.M.A., Liverpool, 1950.

CARDIAC ARREST DURING ANAESTHESIA

The experienced anaesthetist nowadays hardly ever meets with a case of cardiac arrest during anaesthesia. Though this emergency is rare, its treatment is now clear: immediate cardiac massage offers the only hope of re-starting the heart. But the patient will survive only if the heart is re-started before anoxia has caused irreversible damage to the brain. If there is damage but the patient survives, various nervous lesions may be left. Even in cases of apparent recovery mental changes may be a late result.

Courville[1] has already pointed this out in an important book. He recorded in it reports of a number of cases all of which showed the effects of cerebral damage as a consequence of anoxia. They ranged from death to the mildest mental changes, some appearing long after the incident. Another case of the latter type, so often missed, has recently been put on record by Turner.[2] The patient, a healthy young man of 29, was to have a submucous resection of the nasal septum. Cyclopropane was administered, and then, perhaps unwisely, 2 ml. of 1-in-1,000 adrenaline solution was injected into the submucous tissues. The heart promptly stopped but was re-started after a subcostal incision had been made and massage carried out. Not until the third day did consciousness return, and not until the tenth day did the patient become correctly orientated. A year later he showed signs suggestive of a mild frontal-lobe syndrome with distinct personality changes. After two years had elapsed he appeared to have made a good recovery, but amnesia for twelve hours before and four days after the incident remained. Anaesthetists should study this case and others like it described in Courville's book. Fortunately those methods of using nitrous oxide whereby the patient is "blacked out" are now outmoded, and recently described methods[3 4] of using this gas indicate the importance of suitable and sufficient supplementary drugs.

If the patient's heart stops during anaesthesia speed in performing cardiac massage is essential for success. The emergency demands heroic treatment, and tardiness due to diffidence or ignorance in these circumstances may cost the patient, at worst, his life or, at best, his senses.

[1] *Untoward Effects of Nitrous Oxide Anaesthesia.* Mount View, California. 1939.
[2] *J. Neurol. Neurosurg. Psychiat.*, 1950, **13**, 153.
[3] Mushin, W. W., and Rendell-Baker, L., *British Medical Journal*, 1949, **2**, 472.
[4] Neff, W., Mayer, E. C., and Thompson, R., ibid., 1950, **1**, 1400.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE FAILING HEART

BY

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While dyspnoea is constantly present in heart failure, the symptoms and signs as a whole vary according to the cause of the failure. Thus heart failure in mitral stenosis is very different clinically from that in hypertensive disease. The recognition of these divergences and of their importance dates from the improved methods of determining circulation time and cardiac output during the past 20 years; moreover, the better understanding of the circulatory derangements in the various syndromes of failure has led to a more discriminating therapy. Although digitalis still holds an honoured place as a specific cardiac remedy, it is by no means in every case the most important, or even an advisable, medicament. For these reasons it will be best here to consider first the recognition of heart failure in general and in its various forms; the basic principles of prevention and treatment will then be reviewed. Each important syndrome of failure in relation to its cause will be considered and its treatment and management described. The various forms of acute failure, such as occur in cardiac infarction, diphtheria, and pulmonary embolism, will not be dealt with.

Recognition of Early Heart Failure

Breathlessness on exertion is the most constant indication of diminishing cardiac reserve, although this symptom obviously has many other possible organic causes, notably diseases of the lungs. But it may also derive from disorders of function such as the effort syndrome. When difficulty is encountered in distinguishing an organic from a functional dyspnoea the following points in symptomatology will help: breathlessness due to disease of the heart will be proportionate to the amount of exertion and may be accompanied by cyanosis; it will be constant from day to day and the patient will often claim that he feels quite well when the symptom is not being produced. Shortness of breath due to functional causes (e.g., in effort syndrome and sighing breathing, or suspirious) varies greatly from day to day and even from hour to hour, bearing no precise relation to the degree of effort; and, apart from this symptom, the patient has other complaints, often numerous, such as dizziness, "nerves," and insomnia.

The failing heart usually implies a diminishing cardiac output, and thus a reduced blood supply to muscles and vital organs. Physical weakness and disinclination for activity result. Sleep may become disturbed from no obvious cause, and the patient may have found benefit from using extra pillows. Cough is not uncommon, particularly on lying down at night. This symptom and paroxysmal nocturnal dyspnoea will be referred to later in the section on left ventricular failure. Instrumental or other special methods of investigation find little application in the diagnosis of cardiac failure, but radiographs will reveal engorgement of the branches of the pulmonary artery when the left ventricle is failing and at a time when there may be no other manifestation except paroxysmal dyspnoea. Some enlargement of the heart will be found in almost every case in which dyspnoea is of cardiac origin.

While in adults the first signs of congestive failure are rales at the bases of the lungs and oedema at the feet, in children the most important indication is the respiratory rate. This has been pointed out by Taussig, who states that when the rate exceeds 30 a minute the liver begins to enlarge. She draws the inference that rales at the bases in children cannot be taken as being due to failure unless a rapid respiration rate and hepatic engorgement coexist.

Treatment of Early Heart Failure

When the cardiac reserve is waning but before congestion has developed, adjustments in the regime and mode of life are of greater importance than medicines. The first requirement is to lessen the work of the heart. The obvious means of doing this is by curtailing the patient's daily activities and increasing his hours of rest, both at night and in the daytime. A laborious occupation must be discontinued and lighter work sought. If insomnia impairs the night's rest a sedative at bedtime, such as phenobarbitone 1 gr. (65 mg.) or sodium amytal 2 gr. (130 mg.) should be given. At this stage digitalis therapy is not required. The work of the digestive system may be lessened by avoidance of heavy meals. A search for contributory causes of overburdening of the heart should be made, and, if found, remedied. Thus coughing should be checked by a codeine linctus. Obesity, which is a common and sometimes heavy burden for the damaged heart, should be corrected by adjustments of diet—chiefly the restriction of starchy foods and the avoidance of fat, fried foods, and sugary foods.

Infections, and particularly those of the respiratory tract, are often immediate causes of heart failure. As shown below, this is especially the case when chronic pulmonary disease overburdens the right heart; but it is also true in other forms of heart disease, and many a patient with advanced hypertension or mitral stenosis holds his own until an attack of bronchitis or influenza ushers in heart failure with increasing breathlessness, which may be paroxysmal. This serious consequence is attributable to toxaemia, the strain of coughing, and the heightened metabolism in feverish illnesses. For these reasons persons with heart disease should do their best to avoid contact with colds or influenza, and if such infections are contracted they should be treated with especial care: anything more than a slight cold will necessitate confinement to the house or perhaps to bed. The infection itself will need prompt treatment according to its nature, and, particularly, measures should be taken for the relief of cough.

Anaemia is a frequent additional burden on the heart, because in this condition there is a great increase in the output and therefore in the work of the organ. If anaemia exists, prompt steps should be taken to determine its nature by blood examination and the appropriate remedy—iron or liver extract—administered. The repair of anaemia may so greatly lessen the work of the heart that failure is averted.

Use of Digitalis

If, in spite of the adjustments of regime and the lightening of the work of the heart, congestive failure develops,

the use of digitalis becomes necessary. Digitalis is then of value irrespective of the cause of the failure, of the rhythm of the heart, the level of the blood pressure, and the presence or otherwise of mitral or aortic lesions. This drug, however, cannot be effectively administered unless the facts concerning excretion and action are known. The body can eliminate about 20 minims (1.2 ml.) of the tincture or 2 gr. (130 mg.) of the leaf preparation in 24 hours; only when the daily dosage exceeds these amounts does digitalis begin to accumulate in the body. When a certain concentration is reached in the body the dyspnoea of heart failure is relieved, diuresis sets in, and the discomforts due to oedema of the legs and engorgement of the liver disappear. Digitalization is the process of securing this beneficial result while avoiding toxic symptoms due to overdosage; these are headache, nausea, vomiting, and slowing of the heart with pairing of the beats.

The quantity of digitalis necessary to bring about digitalization in a patient of 10 st. (63.5 kg.) weight is about 20 ml. of the tincture or 30 gr. (2 g.) of digitalis folia. For lighter patients less will be needed in proportion, and for heavier patients more. The digitalizing total may be given in divided doses over a period of 24 hours (rapid digitalization); thus an initial dose of 90 minims (5.4 ml.) of the tincture could be followed by 60 minims (3.6 ml.) after six hours, and 30 minims (1.8 ml.) six hours later, and thereafter 20 minims (1.2 ml.) thrice daily, this amount being increased or diminished. Sometimes in very rapid fibrillation with a heart rate of 150 a minute or more, or when a speedy result is essential, "digoxin" may be used in doses of 1.5 mg. orally or 1 mg. intravenously. These doses will produce full effects in six and two hours respectively, but they must never be given if the patient has been taking digitalis during the previous 10 days.

In general, these very rapid methods of digitalization are not necessary, and satisfactory effects upon congestive failure are produced in several days by the use of an initial dose of 6 gr. (0.4 g.) of the leaf followed by 3 gr. (0.2 g.) at six-hourly intervals, until the symptoms of dyspnoea and congestion are alleviated or toxic symptoms are produced, when the administration should be stopped for 12 hours and continued subsequently at a dose of, say, 2 gr. twice or thrice daily. Thereafter a maintenance dose of digitalis must be determined; this may range from 2 gr. of the leaf thrice daily to 1 gr. daily.

Treatment of Left Ventricular Failure

This is a very common form of heart failure, because the chief causes—namely, hypertensive disease and aortic valve disease—occur so frequently. The patient becomes aware of breathlessness on exertion, perhaps slight, and then experiences a paroxysm of dyspnoea which usually wakens him from sleep. The distress may be short-lived, so that sleep is soon resumed, or it may become a protracted struggle to breathe, lasting for an hour or more. For this disorder morphine is a sovereign remedy and should be given subcutaneously in doses of ¼ to ½ gr. (16–22 mg.), repeated in half an hour if necessary. The patient should be propped up well with a back rest or pillows in bed or in an arm-chair. The latter is especially helpful in severe cases, as the dependent posture of the legs slows venous return and helps to lower the pressure in the right auricle; in the overloaded heart this results in an augmented cardiac output, so that pulmonary congestion is relieved. If, in spite of the use of morphine, dyspnoea persists or pulmonary oedema or Cheyne–Stokes breathing appears, an intravenous injection of theophylline ethylenediamine ("cardophylin") should be given—0.48 g. in 10 ml. of distilled water, administered slowly. Some patients with failure of this kind who have high blood pressure and distended veins with normal rhythm respond more dramatically to venesection than to any other procedure. This may be carried out either by slitting the antecubital vein direct through the skin with a sharp scalpel or by introducing a wide-bore Record needle or French's needle into the vein. In either case, after 15 to 20 oz. (420–570 ml.) of blood has been withdrawn, a pad and firm bandage are applied and the arm allowed to lie in a horizontal position.

In some patients with left ventricular failure there is, in addition to the usual features, conspicuous bronchospasm aggravating the respiratory distress. The safest means of treating this will be by the oral or, if necessary, intravenous administration of one or other of the theophylline derivatives, such as cardophylin or "monotheamin." Ephedrine and adrenaline are, in general, contraindicated in heart failure owing to their liabilty to increase the work of the heart; however, if the measures mentioned above fail to relieve bronchial spasm a subcutaneous injection of adrenaline hydrochloride, not exceeding 4 minims (0.25 ml.) in a 1 in 1,000 solution, might be tried.

When pulmonary oedema develops and is not quickly relieved by the methods described above, oxygen administration should be started without delay. The method of choice is the transparent oxygen tent which forms a canopy over the head of the bed. There must be no open fire in the room if this method is used, owing to risk of explosion.

Episodes of paroxysmal dyspnoea are due to failure of the left ventricle to discharge fully its contents, so that blood begins to accumulate in the left auricle and the pulmonary circulation. The attack should be a signal for a thorough review of the patient's mode of life, the state of the heart, and the general condition. Rest in bed is ordered for a week or two, the patient being placed on a light diet with no added salt; the intake of fluids during the latter part of the day is avoided so far as is possible. If oedema exists three or four injections of 2 ml. mercurial diuretic are given intramuscularly or intravenously at four-day intervals. Even if there is no oedema one or two such injections may help to relieve paroxysmal dyspnoea. Apart from the longer-term measures, one of the best preventives for nocturnal dyspnoea is a draught containing chloral hydrate 10 gr. (0.65 g.), with nepenthe 20 minims (1.2 ml.), given at night. In chronic left ventricular failure, digitalization, preferably by one of the slower methods described above, is often of value, and may bring good results when other therapy has failed. Large doses in hypertensive disease may induce auricular fibrillation.

Heart Failure in Chronic Rheumatic Heart Disease

Heart failure in mitral stenosis is compatible with a longer tenure of life than failure in any other chronic heart disease. I have records of a patient whom I have seen in failure at intervals during eight years, and it is not uncommon for failure to recur at intervals for four or five years. Failure in these patients is ushered in often by bronchitis or other respiratory tract infection, or sometimes by physical strain; fibrillation may make its appearance at this time or it may have existed previously. It is particularly in failure associated with fibrillation of rheumatic origin that digitalis effects its most brilliant results, and the rapid digitalization method, with massive or intravenous dosage, finds its chief application when such failure has developed suddenly with a very high heart rate.

Digitalization will be employed in conjunction with mercurial diuretics. Venesection is not advisable in these

patients. On account of the vascular engorgement and the oedema of the lungs, oxygen administration will often be of value in the initial stages of treatment of severe failure. Pulmonary infarction (generally due to embolism) is perhaps commoner in this variety of failure than in any other; pleural pain, sudden dyspnoea, or jaundice otherwise unexplained should arouse suspicion of this complication, which should be treated with morphine injection and oxygen therapy.

The Failing Heart in Chronic Pulmonary Disease

This form of failure, usually following long-standing bronchitis and emphysema, is one in which the cardiac output is substantially more than normal. Recognition of this fact is fundamental in treatment, because the raised output is a compensation for the reduced oxygenating power of the lungs. Any treatment, such as venesection, that depletes blood volume will be detrimental. For the reason that it may lessen cardiac output by lowering venous pressure, full digitalization may be prejudicial to these patients.

Failure in patients with chronic pulmonary disease most commonly develops in the winter months, and the first cold or foggy spell of the autumn reduces many of these patients to a serious condition in a few days. Such breakdown is due principally to recrudescence of infection in the respiratory tract. The lung symptoms become worse, with severe dyspnoea, wheezing, and cough; cyanosis deepens, while the cervical veins and liver become engorged; headache and mental confusion develop. This is one of the few forms of heart failure in which pyrexia may coexist, but fever is not always present. Normal rhythm may be maintained or fibrillation may supervene.

Treatment is based upon the existence of cyanosis and infection: oxygen therapy should be instituted at an early stage and maintained for days or a week or two, and at the same time penicillin treatment (200,000 units I.M. every six hours, or "prolopen" 1 ml. daily) should be started, whether or not obvious infection or fever exists. Sulphadimidine may be employed in addition. The necessity for immediate effective treatment in these cases makes it impracticable to await sputum examinations and tests of penicillin sensitivity of suspected causal organisms. The measures described will often retrieve situations that are well judged to be desperate.

Digitalis may be employed at a later stage, but only in moderate dosage, such as tab. digitalis folia 2 gr. twice or thrice daily. Morphine, if it is used, should be given in small doses and in conjunction with atropine. A few injections of mercurial diuretic should be given if oedema is more than slight. While salt should be restricted, too great a reduction of fluid intake should not be made, three pints (1.7 l.) in the 24 hours being a suitable quantity.

Some Less Common Forms of Failure

In thyrotoxic heart disease, heart failure develops only after many years, and generally only when no adequate treatment has been given for the thyroid disorder. Indeed, by the time heart failure sets in evidence of active thyrotoxicosis may be lacking; the ruins of the cardiac structure and its chaotic function are the relics of a fire that is smouldering or extinct. Such patients have hearts that are enlarged and fibrillating rapidly; they often have hypertension; the evidences of failure point to both ventricles, so that there is often pulmonary oedema and hydrothorax, while the liver and the cervical veins are engorged. The usual regime of bed-rest and fluid and salt restriction is necessary, coupled with digitalization, which should be by fairly rapid oral methods. If swift control is gained by these methods it is an indication that little or no thyroid influence remains. Sometimes digitalis alone fails to control the heart rate, and success following the simultaneous administration of Lugol's iodine points to persisting thyrotoxicosis. In this case the treatment of failure must be followed by the treatment of the thyrotoxicosis either by operation or by methyl or propyl thiouracil.

Failure develops often in later middle life among patients who have severe thoracic deformity. In these cases cervical venous engorgement may be masked and hepatic engorgement may be difficult to assess. Increasing dyspnoea and oedema of the legs, with signs of pulmonary oedema, are the important indications. Treatment will be based on the general lines already described in conjunction with digitalization that is not too rapid. The evidences of right ventricular failure ultimately predominate and call for oxygen therapy, and the antibiotics if respiratory tract infection is suspected.

Treatment of Advanced Chronic Failure with Anasarca

This condition may be the final stage of failure due to any cause. The duration of life must in any case be short, and the aim of treatment is to secure comfort by dispersing the accumulation of fluid. In the first place salt intake must be reduced to less than 0.5 g. daily, milk being restricted and salt-free bread and margarine being used. Fluids are cut down to 25–30 oz. (0.7–0.8 l.) in the 24 hours. Any accumulation of fluid in the pleural cavities must be removed. If the legs have become greatly swollen with fluid and mercurial diuretics are diminishing in effect, then drainage of the legs by Southey's tubes is called for. It is often found that removal of fluid collections by these various means allows some restoration of cardiac function. Thus kidney function is improved and the mercurial diuretics regain their efficacy. Slowly the longer-term measures of salt restriction take effect and the patient may ultimately be quite rid of the oedema. He thus may become able to leave his bed by day and sleep undisturbed at night. Measures of this kind may be effective also in the even more intractable cases where there is recurrent ascites due to chronic congestive changes in the liver. Fluid accumulation may by these means be confined to the abdomen and the intervals between paracenteses be considerably lengthened. Mercurial diuretics function well when given intraperitoneally, and 1.5 ml. in 10 ml. normal saline introduced at the conclusion of tapping will sometimes produce a better result than intramuscular injection in disorders of this kind.

Dr. I. C. Fang, of the World Health Organization, has recently gone to Bangkok, where he will temporarily direct W.H.O. health activities in the Western Pacific. A regional organization, grouping all countries in that area, is to be established early next year. It is expected that the regional committee of W.H.O. member States in the Western Pacific will hold its first meeting in February or March to recommend the permanent location of the regional office, designate a director, and outline health campaigns needed in the various countries. Several international health programmes are now under way in the Western Pacific region: they include W.H.O. nursing, sanitation, hospital, and tuberculosis services in China, and joint W.H.O./Unicef programmes for mother and child health in Sarawak, Brunei, North Borneo, Hong Kong, and South Korea, as well as B.C.G. vaccination campaigns against tuberculosis in Singapore, Malaya, Formosa, and the Philippines. It is expected that the temporary W.H.O. office will be in Hong Kong until a permanent site is approved by the United Nations.

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY

MEETING IN LONDON

The 16th International Congress of Ophthalmology, attended by over 1,000 members representing 64 nations, was opened by the Duke of Gloucester on July 17 at Friends House, Euston Road, London. His Royal Highness delivered a message of good will to the assembly from their Majesties the King and Queen, who had graciously consented to be patrons of the Congress.

Professor J. W. NORDENSON (Stockholm), the president of the International Council of Ophthalmology, stressed the importance of these gatherings, which enabled experiences to be pooled and misunderstandings smoothed away. He also paid generous tribute to the services rendered by Great Britain, not only in the organization of previous international congresses, but in scientific and clinical discovery as well.

Inaugural addresses were delivered by Dr. EDWARD HARTMANN (Europe), Dr. JOHN H. DUNNINGTON (North America), Professor R. ARGAÑARAZ (South America), Sir JAMSHEDJI DUGGAN (Asia), Dr. ABDEL FATTAH EL TOBGY (Africa), and Dr. J. RINGLAND ANDERSON (Australasia). Professor Nordenson then presented the Gonin Medal to Dr. H. ARRUGA (Barcelona) for his outstanding services to ophthalmology. Since the opening of the Congress Dr. Arruga has also been created a count, and he and Sir Stewart Duke-Elder have both received Honorary Fellowships of the Royal College of Surgeons of Edinburgh.

Presidential Address

The chairman of the Congress, Sir STEWART DUKE-ELDER, in his opening address said that modern ophthalmic surgery was now two centuries old and dated from the achievement of that great Frenchman Jacob Daviel, oculist to Louis XV, who introduced his operation for cataract in 1747 and communicated his method to the Academy in Paris in 1752. This year also marked the centenary of ophthalmology as an independent specialty within the larger kingdom of Medicine, owing to the genius of Herman von Helmholtz, who first demonstrated his ophthalmoscope to the Physical Society of Berlin on December 6, 1850. The new world opened by Helmholtz was explored with enthusiastic zeal: it must indeed have been exciting living at a time when within a few years so many things no one had even dreamed of were disclosed, when, almost every few months, a new disease was discovered and described. There was the work of Bowman and others on the minute anatomy of the eye, of Donders on refraction and the prescribing of spectacles, and of a host of others on new techniques in surgery—all within the first decade after the ophthalmoscope was introduced.

In the hundred years which had followed, they had been reaping the fruitful harvest of this prodigal sowing, consolidating and expanding, but adding little that was fundamentally new and revolutionary. Improvements and intricacies of techniques had been added one to the other: von Graefe's iridectomy for glaucoma had evolved into a dozen drainage operations, and Daviel's extraction of cataract was to-day transformed. The only great revolutionary concept that had been added to the techniques of surgery was the treatment of detachment of the retina by Jules Gonin, whose memory they were proud to honour.

They had surely reached the stage when the ophthalmoscope and the microscope had revealed most of their secrets; for revolutionary new advances they required revolutionary new techniques. Virchow's theory of cellular pathology wherein the cell was taken as a unit had moulded pathological thought for 100 years. But to-day they could go further: they could leave the world of cells and enter the world of atoms and molecules. From the structural point of view the electron-microscope was opening out a new and more intimate universe within the cell. From the functional point of view they could follow metabolic processes through all their intricacies by means of radioactive elements.

The first great revolutionary victory had already been won. It was now possible to overcome a great number of infective organisms—not by their mass slaughter by antiseptics but by interfering with their intimate metabolism by penicillin and other antibiotics. Ophthalmology was leaving its first century of adolescence and entering its second century—its adult life.

Bowman Memorial Service

On Sunday, July 16, the day before the Congress began, a short religious service, at which the Venerable the Archdeacon of Hampstead officiated, was held in St. James's Church, Piccadilly. Professor J. W. NORDENSON paid tribute to the memory of Sir William Bowman, founder of the Ophthalmological Society of the United Kingdom, and afterwards laid a wreath at the Bowman memorial tablet. Sir STEWART DUKE-ELDER thanked Professor Nordenson for his gesture of sympathetic understanding, and referred to the warmth of Sir William Bowman's personality, as well as to his achievements in the realm of ophthalmology.

Scientific Activities

"The role of the sympathetic nervous system in the genesis of vascular hypertension and its effect upon the eye" and "The clinical and social aspects of heredity in ophthalmology" were subjects to each of which one whole morning was devoted.

At the other six scientific sessions three halls had to be used concurrently for the presentation of 131 papers on other subjects, including detachment of the retina, choroido-retinal degeneration, the pathology of the aqueous humour, corneal grafting, radiotherapy, glaucoma, the technique of cataract extraction, electroretinography, and aniseikonia.

Retrolental Fibroplasia

Special interest was aroused by a paper on retrolental fibroplasia by A. B. REESE and F. BLODI (U.S.A.), who showed slides demonstrating the presence of angioplastic tissue in the retina of affected babies during the active stage, which lasted for about ten weeks. Haemangiomata of the skin were found in about 18% of the cases. Apart from the fact that nearly all the babies affected by retrolental fibroplasia were premature, the aetiology of this disease remained unsolved. The ocular manifestations were only one aspect of a systemic malady; associated changes had been found in many other organs and tissues. Slight exophthalmia had occurred initially in some of the more severe cases. In a fully developed case the anterior chamber was shallow; the iris was atrophic and partially adherent to a lens progressively opaque. Until the cataracts had become dense, irregular masses of connective tissue were visible in the vitreous chamber.

Dr. Reese's statistics underlined the increased incidence of retrolental fibroplasia in the United States since 1943, so that to-day it would appear that a premature baby with a birth-weight of less than 4 lb. had a 1 in 14 chance of being afflicted with the disease. This risk was doubled when the birth-weight was less than 3 lb.

Professor A. FRANCESCHETTI (Geneva) and his assistant, Dr. J. D. BLUM, both testified to the rarity of retrolental fibroplasia in Switzerland, and Professor Franceschetti wondered whether wrong classification might partly account for the discrepancy. He suggested that the term "hyaloretinal dysplasia" might well be adopted to embrace this and kindred diseases. Dr. REESE maintained, however, that in the compilation of his figures he had been careful not to include cases of persistent posterior vascular sheath, congenital falciform fold, and other conditions likely to simulate certain phases of retrolental fibroplasia.

[Evidently the incidence of retrolental fibroplasia varies in different countries, but this disease is not as rare in Great Britain as it appears to be in Switzerland. At the Hospital for Sick Children, Great Ormond Street, and at other hospitals, the reporter has seen at least 25 cases within the last year. Inquiry among several British colleagues, although not yet

documented by statistics, shows that the incidence of retrolental fibroplasia has risen to a disquieting level, so that the task of prevention is becoming urgent.]

Ocular Effects of Hypertension

Professor F. H. Adler (Philadelphia), who opened the discussion on "The role of the sympathetic nervous system in the genesis of vascular hypertension and its effect upon the eye," emphasized that stenosis of the arterioles was a cardinal fact in hypertension, but he went on to insist that the main problem was to explain the reason for this vasoconstriction. Did it arise from direct intervention of the nerve supply to these vessels, or was it an effect of some chemical substance? If the latter supposition was true, did the humoral agent exert immediate action upon the vessel walls, or did it influence the vascular calibre through the medium of the medullary vasomotor centre?

According to Professor Adler, the role of the sympathetic nervous system was secondary, and the known facts indicated that a humoral substance acting upon the vessel walls must be the explanation in a typical case of arterial hypertension. He asked, Why, then, did sympathectomy ever produce good results? Elimination of "pressure peaks" was the reason. When the average level of arterial pressure was higher than normal, vasoconstrictor impulses were apt to produce a disproportionate increase in peripheral resistance. Thus arose the threat of a vascular crisis, which might produce retinal damage or fatally interfere with the brain. The cardiovascular system could sometimes adapt itself to pressure levels far beyond normal limits, but sudden increments were less likely to be tolerated. At any rate the nervous control of vessels within the eyeball was not abolished by operations upon the sympathetic system. Therefore the benefit undoubtedly conferred by such treatment upon some cases of hypertensive retinopathy must be attributed not to any action upon the blood vessels of the retina but rather to a flattening of the peripheral resistance peaks elsewhere in the body.

Continuing the discussion, Dr. S. Schiff-Wertheimer (Paris) also recognized the basic role of peripheral resistance, but drew attention to the multiplicity of the factors concerned in the regulation of blood pressure. They had to bear in mind not only such obvious influences as the cardiac thrust, the blood volume, the recoil of the great vessels, and the resistance of the distal arterioles, but also nervous regulation, both central and peripheral, together with the incalculable effects of the endocrine system. Dr. Schiff-Wertheimer said that she believed there was a reversible and an irreversible phase of hypertension, although admittedly there was no abrupt line of cleavage between the two. Ophthalmoscopy might supply a clue to differential diagnosis, but prognostication founded mainly upon this mode of examination often proved fallacious. She agreed with Professor Adler's contention that sympathectomy did not augment the calibre of the retinal arteries, but claimed that the operation usually mitigated retinal damage in so far as it might be due to abnormal capillary permeability.

Mr. Hedley Atkins (London) pointed out that the patients with hypertension were as numerous as those affected by cancer, and that the vascular changes found were the results and not the causes of raised pressure. He regarded the retinal changes found in malignant hypertension as images or heralds of pathological processes in the kidneys. Patients with this severe form of the disease were as a rule comparatively young. Shortness of breath, intellectual decline, and irascibility were characteristic manifestations, and many patients complained mainly of headache, which was particularly severe after a sleep. Drugs might relieve such headaches, but lasting relief was unlikely without operation.

The difficulties attending comparison of various surgeons' results were stressed by Mr. Atkins. So much depended upon individual selection of cases, although most authorities agreed that the prospect of benefit faded when they operated upon patients more than 55 years old. He surveyed the main surgical methods, but himself favoured the Smithwick procedure, which was less mutilating than some of the rival operations. Charts illustrating the favourable effect of this operation upon certain cases were shown.

Dr. A. J. Bedell (U.S.A.) pointed out that most hypertensives displayed no changes in the fundus. This generalization was based upon the study of more than 2,500 fundus photographs. Nor was it correct to assume, as did many observers, that an increased reflex along the retinal arteries was pathognomonic of raised pressure. Another consideration to be borne in mind was the capacity of the retina to absorb haemorrhages and exudates, whether the patient was being treated or not. Naturally they would be replaced by other exudates and haemorrhages in many instances, but that tendency might be modified by rest in bed. In other words, recumbency rather than any particular operation might well deserve the credit in certain alleged surgical cures.

Dr. I. S. Tassman (U.S.A.) emphasized the importance of emotion, especially anxiety, apprehension, or anger, as factors modifying the blood pressure. Various material factors, proved by experiment to have an effect upon the pressure, were in their turn subject to the influence of emotion, under the ever-changing conditions of life outside the laboratory. Such influence would often be mediated through the thalamus. Dr. P. Bailliart (Paris) maintained that the actual calibre of the vessels was less important than the permeability and degree of fragility manifested by their walls.

Heredity in Ophthalmology

Professor Laurence H. Snyder (U.S.A.), who opened the discussion on heredity, insisted upon the need for thoroughly investigating the family history before making decisions about genetic disease. Nor should the observer's attention be confined to families exhibiting a high incidence of the particular abnormality. Sporadic cases often illuminated the problem of inheritance so long as they remembered that sporadic instances might be fortuitous. This speaker also mentioned the problem of genetic carriers. He dwelt upon the fact that genetic influences could be profoundly modified by environment, and vice versa. Thus the distinction between inherited and non-inherited congenital defects was far less rigid than was formerly supposed. Another interesting aspect of the subject considered by Professor Snyder was the part played by enzymes in the fulfilment of pathological changes hinging upon a faulty gene.

Miss Ida Mann (London and Perth, Australia) also spoke of the intimate relationship obtaining between hereditary and environmental factors, and she suggested the subdivision of congenital ocular defects into four groups: (1) dependent upon the parents' genetic constitution, (2) due to gene mutation, and therefore transmissible but not inherited, (3) due to some genetic factor activated by an environmental influence, and (4) entirely attributable to environment. Miss Mann proceeded to describe some of her own experimental work on the transmission of ocular and other defects in mice and rats. She emphasized the importance of such work as a means of interpreting lesions found in human subjects. Recent statistics showed an enormous increase in the proportion of cases of blindness due to congenital defects of the eye. Many of these abnormalities could be prevented by making parents aware of the facts, and especially the fact of "anticipation," in Nettleship's sense of that word.

Professor A. Franceschetti's remarks were founded upon work done with his colleagues D. Klein, S. Forni, and J. Babel at Geneva. He discussed a number of inherited fundus diseases, particularly those which attacked the macula. The relationship of cutaneous dystrophy and choroido-retinal degeneration was also considered.

Demonstrations

Clinical demonstrations interspersed with sightseeing tours during the week preceding the Congress were organized by Dr. G. I. Scott (Edinburgh) and by groups of English ophthalmologists. During the Congress week members were free to visit the Institute of Ophthalmology in Judd Street, where the departments of pathology, medical illustration, physiology, and chemistry were on view. Special physiological and pathological demonstrations were arranged there

during each afternoon. Operative sessions, orthoptic work, and demonstrations in radiotherapy, physiotherapy, and colour television were also placed on the programme, and the Association of Dispensing Opticians staged a show of artificial-eye fitting, including the "mobileye," a prosthesis used in conjunction with the Hamblin-Cutler implant. Contact lens manufacture and fitting were also demonstrated.

Films and Exhibitions

Only a few years ago the ophthalmological film was a rarity, but this branch of activity has now leapt far ahead. Over 60 items had been selected for display, so that six sessions in the auditorium of the Wellcome Research Institution were required for this exceedingly popular part of the programme.

A whole week might profitably have been spent upon the superb clinico-pathological display set out in the Wellcome Research Institution, but there were, in addition to that, other treasures, including historical books, early operating instruments, and spectacles. A number of beautiful histological specimens were on view, the principles of illumination were exhibited, and an excellent museum of social and industrial ophthalmology had been assembled in the London School of Hygiene and Tropical Medicine. The display of work done by blind people showed the variety of occupations that can be successfully followed without the aid of vision.

A skilfully planned array of ophthalmological and surgical instruments, books, and drugs was on view at the St. Pancras Town Hall.

Ancillary Societies

At a scientific session of the International Association for the Prevention of Blindness, under the presidency of Dr. P. BAILLIART (Paris), reports upon "nomenclature and classification of the causes of blindness" were submitted by several delegates. The International Organization against Trachoma held a discussion on the initial signs of trachoma, which was opened by the president, Mr. A. F. MACCALLAN (London). Eight other papers were read.

Social and Other Events

The Old Library in B.M.A. House, Tavistock Square, was used as the registration office for the Congress, and an information bureau was set up in the Hastings Hall. On July 17 a reception and dance were held at Grosvenor House. His Majesty's Government arranged a reception at the Tate Gallery on July 18, when visitors were welcomed by the Right Honourable Aneurin Bevan, M.P., Minister of Health. On July 19 receptions were given by the Royal College of Surgeons, the British Medical Association, and the Royal Society of Medicine. Sir CECIL WAKELEY, P.R.C.S., conferred the Honorary Fellowship of the College upon Dr. PAUL BAILLIART (Paris) and Dr. DERRICK T. VAIL (Chicago, Illinois) during the reception at the Royal College of Surgeons. On the eve of the Congress the president and council of the Royal College of Surgeons had entertained the International Council of Ophthalmology to dinner in the council room of the College.

The chief guests at the official banquet of the Congress, held at Grosvenor House on July 20, were His Excellency Lewis W. Douglas, the American Ambassador, and Mrs. Douglas. Mr. M. H. WHITING, president of the Ophthalmological Society of the United Kingdom, presented the Nettleship Medal to Dr. A. J. BALLANTYNE (Glasgow) at Apothecaries' Hall, where some of the senior visitors were entertained to dinner by the officers of the Ophthalmological Society, the Ophthalmic Section of the Royal Society of Medicine, and the Faculty of Ophthalmologists.

Closing Ceremony

At the closing ceremony Professor NORDENSON generously praised the ophthalmologists of Great Britain for the success of the Congress and the warmth of the welcome extended to visitors from other countries. He suggested that it would be inadvisable at this stage to decide where the 1954 Congress should be held. The venue should be left for later decision by the International Council. Closing speeches were made by Professor L. GUGLIANETTI (Europe), Dr. G. STUART RAMSAY (North America), Professor M. E. ALVARO (South America), Dr. N. F. AYBERK (Asia), Dr. R. C. J. MEYER (Africa), and Dr. W. J. HOPE-ROBERTSON (Australasia).

Sir STEWART DUKE-ELDER, the chairman of the present Congress, emphasized the value of friendships formed and strengthened at these gatherings of colleagues from all over the world. He also expressed his warm gratitude to Professor Nordenson, whom he has succeeded as president of the International Council; to Professor H. Ehlers (Copenhagen), whose position as honorary secretary of the International Council now passes to Dr. E. Hartmann (Paris); to Mr. F. W. Law, secretary-general of the present Congress; to all the many helpers and promoters of Congress activities; and to the guests, with their wives and associates.

DEVELOPMENT OF RENAL PHYSIOLOGY

MEETING OF THE RENAL ASSOCIATION

The Renal Association held a special meeting at the house of the Ciba Foundation, London, on July 15 to hear an address on the development of renal physiology by Dr. HOMER SMITH. The president of the association, Dr. A. A. OSMAN, was in the chair.

Dr. Homer Smith said it was a special pleasure to him that the first time he addressed a scientific meeting in England he should be speaking to the Renal Association and that it should be in London, the home of Cushny and Starling. Dr. Smith remarked that Cushny had come into renal physiology "via the gastro-intestinal tract" through his work on magnesium sulphate, which led him to renal catharsis. Cushny remained in London until 1916, when he went to Edinburgh, where he occupied the chair of pharmacology until his death in 1927. He was very much influenced by Starling, who, Dr. Smith remarked, had left a tradition of ultra-filtration which he applied to the capillary bed throughout the body. Starling had bequeathed problems which were far from being resolved to-day and which were as important as the simple concepts that he had left in physiology: no one had had a greater influence since Harvey, except Claude Bernard.

Cushny's Theory

In Edinburgh Cushny studied the literature on the kidney, mainly German and French, and he found a "wrangle of two great views"—those of ultra-filtration and tubular absorption and of tubular excretion. Out of the mélange of conflicting ideas Cushny wrote his *Modern Theory of Renal Secretion*. The experimental era in renal physiology had not yet arrived, and Cushny had approached the matter mainly from the analytic standpoint. He called it the "modern theory," because he said it was not the work of one man but of many. Dr. Smith remarked that on the subject of tubular excretion Cushny might be accused of a historical prejudice. He used the expression: "Renal physiology is the one last relic of vitalism. . . ." Having taken his stand against tubular excretion, Cushny proceeded on the basis of ultra-filtration and tubular reabsorption, and he was faced with the complicated nature of the reabsorbate. There were so many substances that if they were each reabsorbed separately it would again look like exercise of "free will" by the cells—which Cushny would not accept. He therefore stated that both filtration and reabsorption were due to blind physical force and that an "ideal fluid" was reabsorbed without discrimination to maintain the blood in that constancy of composition which Bernard had emphasized.

Cushny was the first to apply modern physico-chemical thinking to the kidney. In 1917 Richards went to France. After the war he met Cushny in Sir Henry Dale's laboratory, and after he returned to the United States he began with Schmidt his classical experiments on the amphibian kidney.

The Glomerular Fluid

Dr. Smith discussed the analysis of the glomerular and tubular fluid obtained by Chambers's microdissection pipette by Richards, Walker, Bordley, R. C. Bradley, Bott, and Westfall. It was found that the capsular fluid was an ultrafiltrate, that glucose was reabsorbed in the proximal tubule and not the distal, and that the distal tubule was concerned with chloride reabsorption, ammonia excretion, *p*H, and hypotonic urine formation.

There was lacking, however, a standard of reference to indicate the degree of water reabsorption. In 1926 Marshall and Grafflin began their studies of the aglomerular fish kidney, and showed that its blood supply was venous in nature—a counterpart of the renal portal system—that there was no glomerulus and the structure resembled the proximal tubule in man.

Inulin Clearance

By now a standard of reference was available in inulin, a polysaccharide with a large molecular weight (5,200). Dr. Smith mentioned that, although the human kidney was not comparable in certain respects with that of the dog, he thought the laboratory experience with inulin was such that it must be trusted as a clinical standard. Inulin gave an identifiable clearance rate, and from the time of its introduction proper experiments began on tubular reabsorption and excretion. Shannon's study on glucose was the first to show a maximal rate in tubular transport. This maximum rate (T*m*) was subsequently determined for a number of other substances—vitamin C, various amino-acids, sulphates, phosphates, creatine, uric acid. Clinically this knowledge was useful, but most interesting was the implication of the possibility of complete clearance.

Dr. Smith remarked that Cushny would not have believed that the normal renal filtration rate per day was 180 litres: this contained 1,200 g. of sodium chloride (or nearly 3 lb.), excretion being regulated to within ± 1 g. a day—an indication of the importance of the kidney in relation to body fluids—400 g. of sodium bicarbonate and 190 of glucose.

Section of the vasomotor nerves had no effect on the renal blood flow. Discussing the question of how the blood flow in the kidney is regulated, Dr. Smith remarked on the constancy of this blood flow and of the filtration rate, and suggested that the next chapter in the history of renal physiology would be headed "Glomerular-tubular balance."

Sodium Excretion

Dr. Smith then discussed sodium excretion in relation to glomerular-tubular balance. He recalled that some years ago it had been postulated that water reabsorption was carried out in two phases, obligatory and facultative, the obligatory absorption taking place in the proximal tubule and the facultative in the distal. In maximum water diuresis about 15% of the filtered water was available for excretion. In extreme osmotic diuresis 60% of water was excreted, although sodium chloride continued to be reabsorbed. It appeared that reabsorption of sodium was independent of the reabsorption of water and that it was an active process. First the sodium chloride was absorbed and then the water diffused back to maintain the osmotic pressure of the urine at approximately that of plasma.

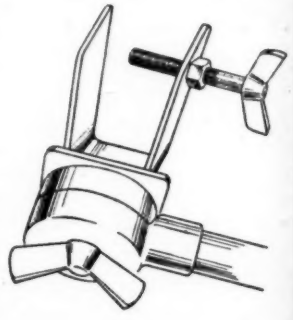
Dr. Smith said that the thin segment consisted of very flat epithelium; many investigators thought that its function was to act as an "osmotic dialyzer." In the distal system the reabsorption of sodium chloride at least appeared to be limited by a critical constant comparable with the constants for glucose and other substances in the proximal system.

In general Merrill's theory of the genesis of oedema in chronic congestive heart failure was supported by recent studies. But it must be recognized that the tubular reabsorption of sodium was importantly influenced by adrenal cortical hormones and other factors. Finally the speaker stressed that modern methods of renal measurement were not suitable for general clinical use. The most valuable clinical method of assessment remained the urea clearance.

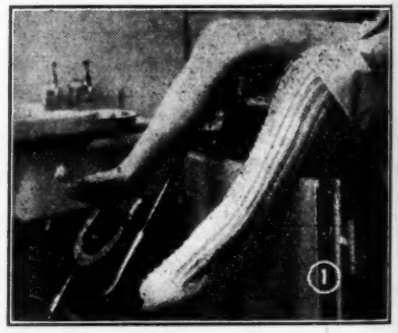
Preparations and Appliances

TREATMENT OF FRACTURES OF TIBIA AND FIBULA

Dr. P. R. SONDHI, Worcester Royal Infirmary, writes: In the treatment of these fractures, with current methods of traction apparatus, it has always been a handicap to apply a plaster-of-Paris cast in two stages. This usually involves handling of the leg by porters and nursing staff while the plaster is being completed. Owing to this uncertain and variable traction, angulation or even shortening can occur.



If a swivel apparatus (see Diagram) is attached to the table end of the Watson-Jones apparatus, traction can be applied with the knee held at any angle. Traction can be done with the knee at right-angles (Fig. 1) and the whole apparatus swung round to the position of slight flexion at the knee, when post reduction radiographs can be taken (Fig. 2). The knee is supported during this manœuvre by a sling and the hip is raised from the table by a sandbag. Counter-traction is applied by raising the foot of the table. The whole leg and the fractures are thus held in a fixed position in which the cast can be applied in one stage.



Another suggested use for this apparatus is that the traction can be applied to the fracture with the knee in slight flexion in cases where it is not desirable or practicable to have the knee in 90 degrees flexion, such as in fracture with ankylosis of the knee. It can also be of use in compound fractures, as the leg is held in a fixed position for towelling and surgical toilet.

The Ministry of Health has sent a circular to superintendents of certified institutions saying that the Railway Executive will allow reduced fares for visitors to patients at hospitals that accommodate mainly long-stay cases. Particulars of the scheme can be obtained from the secretary of the Passenger Committee, Railway Executive, 203, Eversholt Street, London, N.W.1.

ONE HUNDRED AND EIGHTEENTH ANNUAL MEETING

of the

British Medical Association

HELD AT LIVERPOOL AND SOUTHPORT
JULY, 1950

THE SECTIONS

SUMMARY OF PROCEEDINGS

SECTION OF MEDICINE

Thursday, July 20

Pharmacology of Antihistamine Compounds

With Professor ROBERT PLATT (Manchester), a vice-president, in the chair, Professor J. H. BURN (Oxford) opened the discussion on the pharmacological action of antihistamine compounds. He pointed out that many of the substances used medicinally as analgesics and as spasmolytics had common properties, among which was included the ability to act like quinidine on the heart.

During the last war work had been carried out to find substances to replace quinidine. These substances had been tested to assess their ability to reduce the maximum rate at which rabbit's auricle could follow electrical stimulants. It had been found that various local analgesics, including procaine, amethocaine, and cocaine, had an action similar to quinidine, and it had then been discovered that spasmolytics such as atropine, papaverine, and "trasentin" also had such action, as did the analgesic pethidine. "Anthisan" had been found to be twice as active as quinidine. It also had the properties of the other substances; as an analgesic it was not as good as pethidine, though it was more active than aspirin. "Benadryl" had the same effect.

Once these properties had been established it would be expected that the action of these various drugs would merge into one another. From this knowledge, certain practical consequences were to be anticipated. Benadryl, like atropine, might cause drying of the mouth, and like pethidine mental confusion; indeed, all the antihistamine drugs had such side-effects. They had properties like those of hyoscine, which could control sea sickness. In a single-dose experiment on aviators at Randolph Field it had been shown that benadryl and "dramamine" prevented air sickness, though hyoscine was slightly better, failures with benadryl being 30.7%, dramamine 28.7%, and hyoscine 19%.

It was known that atropine might abort a common cold by drying up secretion; so would the antihistamine drugs. One would therefore expect that, just as quinidine would help to restore normal rhythm in the case of auricular fibrillation, so would the antihistamine drugs, and there was no doubt that benadryl gave great benefit in cases of myotonia. One would also expect that, just as procaine had been used successfully to relieve bronchial spasm, pethidine must be even more effective. The basis of these common properties was that these substances had a depressing effect on acetylcholine, histamine, and adrenaline—the substances that controlled activity locally in many tissues.

Professor D. M. DUNLOP (Edinburgh) recorded the clinical results which he had found in treating patients with antihistamine drugs. The drugs were excreted in the urine unchanged, and therefore the administration had to be continued indefinitely, since histamine was continually produced in the body. Most of the cases he had treated were given doses of anthisan varying from 100 mg. to 250 mg. three times a day. He had treated 350 cases, and in 138 (55%) there had been side-effects—mild and passing off within 48 hours in 65, more severe in 60, and severe enough to stop the drug in 13. These symptoms consisted of sleepiness in 58, more persistent sleepiness in 51, nausea in 14, dizziness in 11, dryness of the mouth in 10, feeling of tension in 10, vomiting in 5, diarrhoea in 3, headache in 3, and collapse from hypotension in 1.

He found the best use of the drugs in the treatment of urticaria and angioneurotic oedema, over 80% of the cases being controlled by the drugs, provided the dosage was adequate and properly spaced. They prevented irritation but had no effect on established lesions, though they prevented new ones from occurring. They were effective in uses of urticaria resulting from sensitization to penicillin and streptomycin. While they removed the skin irritation in serum sensitization, they had no effect on the fever and arthralgia of that condition.

In hay-fever anthisan gave relief in 55% of 36 cases, and significant relief in a further 31%. It was certainly far more satisfactory than long desensitization with a specific protein. The results in perennial vasomotor rhinitis were less impressive, but definite. Complete relief was obtained in 54% of 35 cases, with significant relief in a further 34%. He had found antihistamines disappointing in asthma.

In 47 patients with carcinoma of the breast having the same dose of deep *x*-ray therapy who had developed radiation sickness, he had found that 17 patients treated with anthisan did worse than 15 having no treatment and 15 with dummy tablets. He had found benefit from anthisan in cases of liver sensitivity, insulin sensitivity, pruritus, intermittent hydrarthrosis, and paralysis agitans, but no benefit in periarteritis nodosa, dermatomyositis, migraine, allergic purpura, and acute nephritis.

It had no effect on the gastric secretion of hydrochloric acid. It appears, therefore, that antihistamine drugs found their main clinical application in those states characterized by superficial vascular phenomena. The newer antihistamines, though of greater potency and more satisfactory because of increased duration of action or a lowered incidence of side-effects, had so far made no material addition to the list of disorders amenable to this form of treatment. There seemed to be no benefit to be obtained in the deep visceral allergies.

Dr. LESLIE GAY (Johns Hopkins University, Baltimore) recorded the results of his observations with beta-dimethylaminoethyl benzohydryl ether 8-chlorotheophyllinate (dramamine). The investigation was promoted by the observation that in a pregnant woman with urticaria, who had suffered all her life from car sickness, it was possible to control the car sickness at will. A placebo failed repeatedly, but dramamine gave complete relief if she took 50 mg. a few minutes before she boarded a car. Other victims of car sickness, without exception, had been completely freed of discomfort, provided the drug was taken just before exposure to the motion of the vehicle.

Sixty patients who had developed sea sickness on crossing the Atlantic had had the condition controlled by dramamine. Investigation was therefore carried out on a crossing of the Atlantic by troopship in bad weather. There were 1,366 soldiers on board, and the drug was given in a dosage of 50–100 mg. every six hours orally or rectally. It had been effective both prophylactically and therapeutically, and no untoward side-effects had been observed by the investigators. In 319 soldiers treated therapeutically there had been failure in only 8, and in 124 treated prophylactically failure in only 2, compared with the failure in 38 out of 59 treated therapeutically with a placebo, and 35 out of 123 given a placebo prophylactically. It was the only drug which would relieve the condition once the symptoms had developed.

It had been shown in another investigation that among 210 sufferers from sea sickness 204 had been completely relieved; out of 52 with air sickness 51 had been relieved; and out of 59 with car sickness 54 had been relieved: making a total of complete relief in 309 out of 321 patients. There had been partial relief in 6 and failure in 6, while reactions had occurred in 37.

An investigation had then been carried out to determine the effect of dramamine on marksmanship. Ninety-six marines

had been divided into two groups by random selection as to firing ability and as to positive history of motion sickness. Dramamine had had no effect on marksmanship.

Further investigations had been carried out by commercial air lines in the United States. One line in one month had had 270 cases of air sickness among 3,528 passengers. The symptom of sweating occurred in 155 cases and had been relieved by dramamine in 125; nausea had been relieved in 163 out of 207 patients, and vomiting in 66 out of 111. The principal side-effect appeared to be drowsiness, which had occurred in 3.7% of the patients.

Intercarotid injection of di-isopropyl fluorophosphate (D.F.P.), a drug which destroyed cholinesterase and permitted accumulation of acetylcholine, caused "adversive syndrome" in rabbits. Within a minute of injection there was marked constriction of the pupil on the operated side. The head was turned away from that side and the animal was compelled to circle on four legs in the direction opposite to the injected side. The injection of 5 mg./kg. of dramamine intravenously immediately corrected this turning effect. It had also been found that dramamine prevented the epileptic seizures which occurred in rabbits after injection of D.F.P.

He suggested that the effectiveness of dramamine was due to the vasodilator effect of this drug. Nearly all other antihistamines had a vasoconstrictor effect. The vasodilator action was probably produced by the 8-chlorotheophyllin part of the molecule. Dramamine was also found to be effective in the nausea of pregnancy, following vestibular operations, and in radiation sickness.

Professor PLATT said he thought the evidence in favour of the antihistamines in acute nephritis was most unconvincing, and pointed out that the course of this disease was very variable.

Professor BURN, while admitting that dramamine was effective against sea sickness, said that there had not been a controlled experiment to show that it was more effective than hyoscine. Dr. GAY pointed out that this was hardly practicable, since hyoscine was too toxic to give continually over a period of 14 days. He asked why, if such a dramatic response as had been obtained with dramamine was possible with hyoscine—a drug which had been known for a large number of years—it had not been already reported.

Vitamin B_{12}

Dr. J. F. WILKINSON (Manchester) reviewed the present state of knowledge about vitamin B_{12}. It was found in liver, kidney, milk, and the grasses, and contained about 4% of cobalt. Used in adequate dosage of 60 μg. initially, followed by 40 μg. weekly until the blood count returned to normal, and then 20 μg. fortnightly or monthly, it usually caused a good initial response as judged by the reticulocyte count and the subsequent return of the blood to normal. In all cases the bone marrow showed a rapid change in the course of two days from megaloblastic hyperplasia to the normoblastic condition seen in a properly treated case of pernicious anaemia. Since 1948 he had treated 170 patients with pernicious anaemia or subacute combined degeneration of the cord for periods of more than six months. Of these 136 remained well, with normal counts. But the following were exceptions: 28 (16%) had subsequently shown falls in the red blood cells after 3–4 months' treatment on a dosage of 20–40 μg. at weekly intervals in 7, and at fortnightly intervals in 21. Two had given poor response on 40 μg. weekly and had been put back on to liver extracts. Three others had responded very slowly—one taking seven weeks to reach 4,000,000 red cells per c.mm. at 80 μg. weekly; another seven months to remain at over 4,000,000 on 20 μg., and the third three months to reach 4,300,000 before falling again, although he had responded to larger doses. Increasing the dosage in some of these cases had improved the counts.

Vitamin B_{12}, like liver extracts, seemed to reverse in the early stages the neurological symptoms and signs produced by folic acid therapy. Nutritional megaloblastic anaemias seen in the Southern States of America and in Cuba and India appeared to respond well to vitamin B_{12}; but macrocytic anaemias of pregnancy, idiopathic steatorrhoea, and sprue, which did not respond to liver extracts, were usually also refractory to vitamin B_{12}.

He thought that vitamin B_{12} was as efficient as, if not better than, highly potent liver extracts in the treatment of pernicious anaemia and subacute combined degeneration of the cord. But there was more than one factor concerned in the true story of the mechanism of the megaloblastic anaemias; vitamin B_{12} was certainly not *the* factor and not the only one.

Dr. D. RIDING (Runcorn) suggested that in man the normal requirements of vitamin B_{12} were met by bacterial synthesis in the colon. The only foods in which it was found were meat, liver, herring, and egg yolk. Therefore only meat and fish eaters, and possibly young suckling mammals, derived vitamin B_{12} from food. The vegetable-eating populations of many parts of the world must derive their requirements from some other source.

To reproduce in laboratory culture media the conditions maintained in the caecum was obviously impossible. It was likely that in the great symbiotic conglomeration of faecal organisms there must be very many types capable of synthesizing vitamin B_{12}.

Normal gastric juice contained a non-dialysable heat-labile substance which combined with vitamin B_{12} to form a complex which was non-dialysable and not dissociated by dialysis. Vitamin B_{12} in this combination was not available to micro-organisms but was released by heat, whereupon it was again microbiologically active. It was probable that this "inhibitor" was the intrinsic factor of Castle or an important component thereof. In all specimens of human gastric juice which had been examined where free HCl was present, this intrinsic factor had been found in large quantities. The only instances where there was no inhibitor were cases of known pernicious anaemia. It was interesting that some animals did not possess this intrinsic factor. The dog and the pig had it, whereas the horse, calf, and sheep did not.

Vitamin B_{12} given orally to cases of pernicious anaemia in relapse produced a response, so it was possible for man to utilize this vitamin orally without the intervention of intrinsic factor. Could it be that in the carnivora and omnivora, depending as they did on ingested meat for a partial supply of vitamin B_{12}, intrinsic factor acted as a protective mechanism? The combination of vitamin B_{12} with intrinsic factor to form a complex not available to micro-organisms might also prevent destruction of the red substance by the alkaline digestive juices of the upper intestine.

SECTIONS OF SURGERY AND OF PATHOLOGY AND BACTERIOLOGY

Thursday, July 20

Renal Failure

With the president of the Section of Surgery, Professor CHARLES WELLS (Liverpool), in the chair, the combined meeting was opened by Mr. RALPH SHACKMAN (London), who explained that the views he would express were not necessarily those of Professor Ian Aird, for whom he was deputizing. He first mentioned the various types of renal failure, and said that he did not intend to deal with the post-renal obstructive variety. After reviewing certain pertinent points in the anatomy and physiology of the kidney, he described the functions of the various parts of the nephron and the factors influencing them, pointing out that renal failure might be due either to failure of glomerular filtration or to tubular dysfunction. The effects of systemic hypotension were not altogether predictable; glomerular filtration could be maintained under conditions of unusually low blood pressure by various adjustments in the intrarenal vascular mechanism. Changes in the calibre of the efferent arterioles might affect not only the glomerular filtration but also the function of the tubules. Tubular dysfunction was associated with water intoxication, retention of tissue metabolites, and potassium poisoning; the mechanism of this type of failure was probably more complex than it appeared to be. In the early stages of tubular dysfunction the patient could be regarded as virtually having had a bilateral nephrectomy; in the later stages the polyuria, loss of potassium ions, and *p*H imbalance could cause very severe symptoms. The possible

role of the pituitary, adrenal, and parathyroid glands could not as yet be properly assessed. Among the several clinical conditions in which renal failure occurred, Mr. Shackman mentioned oliguria following surgical operations, renal failure associated with gastro-intestinal bleeding, and renal failure after biliary surgery. The first type was incompletely understood; the second type, while chiefly due to absorption of breakdown products from the bowel, was also due to other factors; and the last type, following biliary surgery, might be due to the effects of an unknown toxin and/or peripheral circulatory failure. He concluded with a few words on treatment and said that, although the Borst method was not well tolerated by patients after operations, he believed that Bull, Joekes, and Lowe had made a considerable contribution to our understanding of the proper management of renal failure.

Histological Changes

Professor J. H. DIBLE (London) said that he proposed to confine his remarks to intrarenal causes of renal failure and to concentrate on the histological changes in the kidney. He emphasized the difficulty of obtaining pathological material in the first stages and of assessing the early changes; the results of animal experimental work were not strictly analogous. Though there was no profound significance in the finding, he had found it useful to differentiate between cases of tubular necrosis without pigmentation and those with this change. He thought that there was little or no evidence of glomerular damage and that the condition was chiefly due to tubular failure, the earliest evidence of which was the presence of hyaline material in the medullary and second convoluted tubules. At an even earlier stage there was congestion of the kidney; after 30 hours the hyaline casts appeared, and, in those cases showing pigmentation, pigment appeared after 40 hours. Tubular "blockage" was not evident at this early stage. Between the fourth and sixth days inflammatory changes appeared, and regeneration of the collecting tubules was also obvious. Inflammatory changes and tubulo-venous lesions were, however, secondary events, but they were possibly more marked in the pigmented cases. Later still there was oedema and fibrosis of the medulla, with widely dilated tubules containing flattened epithelium. Professor Dible said that it remained to be decided whether the renal lesions were primary or secondary in nature, but anuria was present before the development of the lesions. The powers of recovery of the kidney, though remarkable, were slow; even with the best treatment some patients did not recover. This was an unsolved problem worthy of the closest consideration. He concluded on a provocative note by offering alternative explanations of the changes so that others would criticize them, and he mentioned cortical ischaemia, obstruction to glomerular filtration, the absorption of toxic substances from the filtrate, a mechanism due to changes in the marginal zone, and, finally, an obstructive lesion lower in the nephron.

Dr. E. M. DARMADY (Portsmouth) said that though oliguria and anuria might have many causes there was great similarity in the histological changes. Some 60 different precipitating factors had been listed, and he himself divided them into seven groups, though some conditions could be placed in more than one group. Of the theories put forward to explain the condition he felt that tubular blockage should be ruled out for three reasons: casts were often minimal or absent; the glomeruli were not dilated; and there was no dilatation of the tubules above or below the casts. He had studied the dissected tubules by the method of Oliver and had been struck by the fact that the casts did not seem to have damaged the related lining of the tubules; he therefore discarded the idea that the casts were nephrotoxic. Dr. Darmady showed a series of slides demonstrating tubular "bursts" with resultant leakage of protein; the nephron seemed to be damaged at many points throughout its course. He thought the shunt theory was not entirely tenable, as was shown by the oxygen extraction studies of Bull. Further, the condition had been produced experimentally by neurogenic stimuli which, it had been shown, were incapable of sustaining the shunt. The pituitary-adrenal mechanism deserved fuller attention, and the general adaptation syndrome of Selye might provide some explanation of the changes seen.

Acute Tubular Necrosis

Dr. G. M. BULL (London) said that with Drs. A. M. Joekes and K. G. Lowe he had investigated 50 patients suffering from acute tubular necrosis of differing cause. These causes ranged from the purely toxic to the purely ischaemic. He and his colleagues had shown that the clinical course was largely predictable and could be divided into four phases: onset, anuric or oliguric, early diuretic, and late diuretic. They had not investigated the first phase, but the work of van Slyke and others made it clear that the reduction of renal blood flow was the most important factor at this stage and its correction called for blood, plasma, or saline tranfusion. In toxic cases, on the other hand, there was probably no significant initial reduction in blood flow; preventive measures and the use of specific antidotes were indicated. In the second phase blood flow might be under 5% of normal; studies by means of renal vein catheterization showed that this was mechanically induced, was not due to a shunt, and was not relieved by splanchnic block. Glomerular filtration was virtually absent at this stage, and there was no renal excretion of water or of sodium, chloride, and potassium ions, or of the end-products of nitrogen metabolism. For these reasons water intake should be 1 litre a day; no minerals should be given, and the diet should be protein-free and of high calorie content. In the anuric phase potassium intoxication was second only to water as a cause of death. On this type of diet the blood urea rose at about a third of the rate that occurred on a protein-free low-calorie diet, and potassium release from the tissues was inhibited. The early diuretic phase was characterized by returning blood flow and increasing glomerular filtration rate and urine flow, with continued poor tubule function. The urine passed was only a slightly modified glomerular filtrate. Water loss could be measured and corrected. The sodium and chloride loss could be predicted because the urine concentration of these substances was approximately half that in the plasma, but the potassium loss was not easily predicted. In practice it was found that once the urine volume exceeded 1 litre a day a diet consisting largely of fruit would maintain adequate potassium levels. The keynote of this stage was adequate mineral replacement. On the average this phase persisted for as long as the anuric or oliguric phase preceding it; for this reason mineral replacement should be continued for this time. Concluding with a few words on dialysis, Dr. Bull said that he had experience of this method. It was theoretically sound, but in practice extremely difficult, requiring a large and experienced team. He believed that with conservative management the mortality of uncomplicated acute tubular necrosis need not exceed 5–10%.

Steps in Treatment

Mr. RONALD W. REID (Colchester) acknowledged the great help given by Dr. Bull and his co-workers. The two main functions of the kidney were, first, the excretion of water and waste products and, secondly, the maintenance of the *milieu intérieure*. Both functions must be clearly remembered in planning treatment lest this should tend to restore one function and to embarrass the other. The first step was, where possible, to remove the cause, and in many general surgical cases this meant the relief of obstruction in the urinary tract; the second step was to correct anaemia, restore blood volume and blood pressure, and so ensure a normal circulation. He agreed with the early limitation of fluid. In the later stages he preferred to use Ringer's solution for fluid replacement, but he thought the use of sodium sulphate a dangerous procedure. Oedema in the kidney could have a serious effect. In two recent cases he had, among other measures, undertaken renal decapsulation. In both of these cases much fluid, containing urea, had drained from the flank wounds; in one case there had been as much as 1,200 ml. He confirmed the great difficulties and dangers of peritoneal dialysis, but by the use of a plasma substitute in the peritoneal wash there was less danger of over-hydrating or dehydrating the patient.

In the subsequent discussion Mr. L. R. BROSTER (London) said that his particular problem had been in adreno-cortical cases. Laboratory control was difficult. Dr. Bull had shown a number of beautiful charts, but he felt that few surgeons

would be able to avail themselves of such expert facilities. Professor CHARLES WELLS referred to the work going on in the Liverpool area, where they had been chiefly concerned in trying to avoid these troubles. He spoke of the use of an adrenaline drip in certain operation cases, and said he would like to know the answers to several problems. What was the mechanism of this condition? When did it occur? How much time had one in which to remedy the early stage of onset? From the remarks made by Dr. Bull and others he presumed that they should not make use of spinal analgesia and splanchnic block in the treatment of the early case. Professor H. L. SHEEHAN (Liverpool) said he had been greatly impressed by Dr. Bull's work and he thought that in it lay their only real hope in treatment. He disagreed with Dr. Darmady's views about cast obstruction; he also had noted damage in relation to the casts (perhaps only five or six cells of the tubule). He believed that there was no connexion between the initial cortical ischaemia and the later changes in the tubules. Mr. R. MARCUS (Liverpool) spoke of the immediate effects on renal function of relieving urinary obstruction, and he demonstrated this by reference to some intravenous pyelograms, one of which had been taken on the operating table just after an enlarged prostate gland had been removed.

Dr. GEORGE DISCOMBE (London) said that they had to consider first the patient with urinary obstruction; secondly, the surgical patient with impaired kidneys who was faced with a severe operation; and, lastly, the patient with established uraemia due to one of the many causes already mentioned. His chief concern had been the last two groups, and in the second group he would emphasize the great importance of keeping the haemoglobin level high and of assuring a correct acid–base balance. At the Central Middlesex Hospital they had seen a number of post-abortive cases and they had had the benefit of Dr. Bull's advice and experience. He had no doubt of the value of the method described by Dr. Bull, for the cases recovered much more readily than his previous experience would have led him to expect. Good results were the rule rather than the exception. Dr. W. N. LEAK (Winsford) recalled that he had been told by a missionary doctor in Formosa some 30 years ago that it was their practice to decapsulate the kidneys in cases of acute nephritis. It had seemed to him that Professor Dible's slides had demonstrated the picture of a pressure necrosis.

Professor WELLS, from the chair, then called on the opening speakers to reply. Dr. BULL said that some speakers had expressed concern about laboratory facilities, but the method of treatment he had described could be carried out with the minimum of laboratory control, or even with no laboratory control at all. In reply to a question about how he had demonstrated changes in the renal blood flow he referred to a method of catheterizing the right renal vein and the various tests they had done. The available evidence suggested that there was no shunt in the stage they had investigated, for the blood in the renal vein was more venous, rather than more arterial as might have been expected. Dr. DARMADY, in reply to Professor Wells's question about how much time there was to treat the early stage, thought that there was probably about eight hours in which to do this. He pointed out that casts tended to occur in one nephron and not in others, while tubular "bursts" might occur anywhere. Casts also tended to occur lower down in the tubules because of greater concentration there. Professor DIBLE said that there were really two main types of tubular necrosis: those cases due to exogenous causes and those due to endogenous ones. He thought that one could not reconcile the cortical changes with a pressure lesion, and this was confirmed by the apparently normal condition of the glomeruli. He agreed with Professor Sheehan that the casts were by no means static and developed with the passage of time. The most remarkable thing of all was that the damage done in such a short space of time persisted and, in some cases, might never recover at all. Mr. SHACKMAN, in conclusion, said that the common factor to both glomeruli and tubules was the blood supply going to the whole nephron, and it was here that they must look for the cause of the condition. Discussing the question of pressure necrosis, he quoted a case in which he had had evidence that the intrarenal pressure was not high. He agreed that prevention was of paramount importance.

SECTION OF CHILD HEALTH

Thursday, July 20

Breast-feeding

The president, Professor NORMAN B. CAPON (Liverpool), took the chair and conveyed the apologies of Mr. E. C. Fahmy (Edinburgh) for unavoidable absence. Dr. F. CHARLOTTE NAISH (York) outlined the history of breast-feeding over the centuries. She drew attention to the varying influence of fashion. Continuity of supervision was the key to successful breast-feeding, and the study of breast-feeding problems was the duty of the general practitioner. Utilizing their opportunities for controlled experiments, the paediatricians had done much to emphasize the importance of breast-feeding. The general practitioner was in a position to see other issues: the emotional integration of the mother that resulted from success with feeding; the success of breast-feeding resulting from increased care of the emotional stability of expectant and nursing mothers; and the resultant improved health of the children.

There could be no questioning the value of antenatal care. Breasts should be examined as a routine at the time of first and subsequent examinations. No comment should be made at the time of the first antenatal examination, as it was not possible to foretell the degree of success which would attend breast-feeding. Fashion determined views on when the newborn baby should be first put to the breast.

For treatment of congestion of the breast Dr. Naish advocated reducing both the time between feeds and the time spent at each feed. Finger-tip massage to the periphery of the breast was valuable where congestion was severe. It was possible that the massage stimulated the "draught" just as the butting of the lactating sheep's udder by lambs might stimulate the "letting down." In Dr. Naish's experience the reduction in secretion which frequently took place in the third week was a feature common to mothers not getting adequate supervision. To obviate it post-natal visits should be made by the family doctor until the end of the fifth week. Where a decline in the volume of milk occurred, immediate resort should be made to complementary feeding, which was best explained to mothers as a form of "topping up," possibly required only temporarily.

The need was for the organization of all looking after the mother with the object of favouring continuity of supervision, and full co-operation between the health services, the obstetrician, and paediatrician, and, of first importance, the family doctor, whose key position must receive full recognition. The family doctor could carry out infant welfare within the ambit of his general practice.

Mr. K. C. RICHARDSON (London) then discussed the structural basis of milk discharge. He pointed out the need to distinguish between milk secretion and milk discharge. In the cow at the time of milking the milk pressure rose—the so-called "let-down." Where this did not occur, less than half the expected yield was obtained, only the cisterns and large ducts being emptied. The rise in milk pressure was due to activity of contractile tissue in the mammae initiated by a neurohormonal mechanism. Experimental evidence justified the belief that nervous reflexes from stimulation of the nipple and breast were transmitted to the posterior pituitary and led to discharge of oxytocin. A contraction resulted independent of smooth muscle surrounding the major ducts. Animal experiments had shown that oxytocin and other substances such as acetylcholine acted specifically on the contractile tissue in the absence of a motor-nerve supply and under conditions of constant blood pressure. Many accounts referred to the contractile tissue as smooth muscle intermingled with the mammary glandular units. There were, however, contractile myo-epithelial cells between the secretory epithelium and the basement membrane. Mr. Richardson showed interesting slides of goat and human material which, by means of a new method of silver impregnation applied to thick sections, clearly demonstrated the presence of myo-epithelial cells. The orientation of the cells was consistent with the assumption that

they squeezed the distended alveoli and shortened the ducts so that they were held open.

He said it was not known whether myo-epithelium was innervated and so possessed a neural as well as a hormonal response. The sensory innervation of the breast and udder had not been sufficiently studied. The effect on the neuro-hormonal mechanism of milk discharge by stimuli from the skin surface and from the cerebral cortex was established, but knowledge was lacking whether filling of the breast influenced the mechanism.

Breast Tension

Dr. H. K. WALLER (Tunbridge Wells) said that security of lactation depended on regular emptying of the breast from the time secretion began. Failures resulted from insufficient regard to the condition of the breasts. He discouraged too hasty conclusions about the relation of failure of milk secretion to such factors as nervous upset and a return to domestic responsibilities. The relation between failure to secrete and excessive milk retention required prior consideration. It was known that involution tended to follow gross overloading of the breasts, and it was possible that distension might give rise to injury and irreversible interference with the function of the secretory cells. Among causes of incomplete emptying of the breasts were a yield in excess of the infant's requirements, lack of strength or of inclination to feed on the part of the baby, and nipples so adherent to deeper structures that effective suckling was impossible.

Discussing reflex stimulation, he suggested that the fact that milk might leak periodically between feeds was possible evidence that milk secretion was stimulated in part by milk tension reaching a certain level. He deprecated the use of rules intended for general application; submitted a plea for more objective study; asked for more help from the anatomist and the physiologist; and asked that obstetricians should realize that breast-feeding cannot be firmly established in the first two weeks of life.

The president, Professor CAPON, said that, while the part psychology played in normal breast-feeding must be respected, study must remain objective. Dr. D. CRADDOCK (Clare) considered that in general practice manual expression need not start before the 36th week of pregnancy, and that some practitioners had not the time to continue supervision for five weeks after the baby was born. Dr. K. M. HIRST (London), referring to a remark by Dr. Naish on co-operation, said it was the duty of the health visitor to visit as soon as possible after the attendance of the doctor or midwife had ceased, and thereafter as frequently as circumstances permitted. Dr. P. D. MOSS (Liverpool) gave self-demand feeding as a means of overcoming the tendency for hospital sisters temporarily to possess infants to the partial exclusion of the mothers. Dr. MARGARET M. FISHER (Luanshya, Northern Rhodesia), speaking as a mother, suggested that hospital routine allowed the mother little rest and that the baby should not be continuously at her bedside. Midwives and mothers-in-law were described by Dr. G. CATHERINE EVANS (Herne Bay) as inclined to have a discouraging influence on breast-feeding. This view, so far as midwives were concerned, was not shared by Dr. ALAN BARKER (Whitstable), who regretted the tendency for early discharge from hospital.

Professor W. S. CRAIG (Leeds) urged that antenatal care should have as one object the discouragement of weaning decided on without professional advice. The expectant mother should have impressed upon her that the doctor, health visitor, and midwife were there to maintain continuity of supervision and to advise if feeding difficulties arose at any time in infancy.

Speaking as an obstetrician Mr. A. H. HOLMES (St. Asaph) attributed many difficulties in breast-feeding to the attitude of the general practitioner, and expressed doubts about the value of stilboestrol in cases of breast congestion. Dr. J. D. HAY (Liverpool) spoke of experience of self-demand feeding at a maternity hospital. Four months' experience had been encouraging. The procedure was practicable and was appreciated by the mothers. Supervision of feeding was less close, but the nursing staff was less overworked.

Replying to points raised in discussion, Dr. NAISH shared doubts expressed about the use of stilboestrol. She urged that management of breast-feeding should not be determined by strict adherence to theories of rigid regimentation or of self-demand. Dr. WALLER described the use of stilboestrol as valuable and justifiable if carefully studied and if the nursing staff was carefully trained.

SECTION OF DERMATOLOGY

Thursday, July 20

Chemotherapy of Venereal Diseases

With the president, Dr. R. STOPFORD-TAYLOR (Liverpool), in the chair, Dr. ROBERT LEES (Manchester) opened a discussion on chemotherapy of venereal diseases, its uses and abuses. He said that the use of penicillin and sulphonamides was advocated in the treatment of gonorrhoea, but reliable tests to establish diagnosis and cure were essential. Streptomycin was preferable if coincident syphilis was suspected. Empirical treatment and neglect of ancillary treatment were common abuses, and overdosage with penicillin might conceal syphilis. He did not approve of penicillin by mouth as a prophylactic against venereal disease.

In cases of early syphilis penicillin alone might be curative, but the amount of drug and the duration of administration required were unknown. A common practice was to combine the use of penicillin, bismuth, and arsphenamines. A treatment schedule suggested had two phases: (*a*) a very intensive attack, lasting two to three weeks, with penicillin, bismuth, and arsphenamine; and (*b*) a prolonged phase—e.g., for six months—with arsenicals and bismuth. The place of penicillin in the treatment of late syphilis was still undetermined. It was valuable in syphilis of the central nervous system and might be useful in the treatment of cardiovascular lesions. For the latter, caution and the proper preparation of the patient by slow-acting drugs were advocated. Congenital syphilis could be prevented completely by antenatal treatment, which should consist of penicillin and bismuth, but not arsenicals. Special technique was needed for lesions such as interstitial keratitis.

Some abuses in the treatment of syphilis were: (1) overdosage, especially of cases of congenital syphilis and of latent cases with "fixed" positive serum reactions; (2) undertreatment of early syphilis, often without established diagnosis; (3) local applications of penicillin; and (4) treatment of healthy persons wrongly suspected of having syphilis.

Dr. SYDNEY M. LAIRD (Ipswich) said that chemotherapy represented a fundamental advance over the symptomatic treatments of earlier centuries. The principles of treatment were essentially the same irrespective of the particular chemotherapeutic drug. Three important factors were the virulence of the organism, the natural defensive powers of the patient, and the efficacy of the drug. The last depended on the sensitivity of the pathogenic organism and the tissue level of the drug which could be established at the site of infection. The combined use of chemotherapeutic agents might sometimes be advantageous. Accurate bacteriological diagnosis before treatment and adequate follow-up were essential.

In gonorrhoea one injection of penicillin was usually adequate for the uncomplicated case. In complicated cases longer chemotherapy and local treatment were required. Penicillin had established its place in the treatment of all stages of syphilis and with few exceptions should replace the arsphenamines. Bismuth compounds should be combined with it in all stages. In late syphilis treatment with bismuth should precede penicillin to reduce the risk of Herxheimer reaction and therapeutic paradox.

Dr. DOUGLAS J. CAMPBELL (Sheffield) thought that there was more rapid clearance and a higher rate of cure with the early pattern of treatment of gonorrhoea in the male with 100,000 units of penicillin than with the modern dosage of 300,000 units of procaine penicillin with 2% aluminium stearate. To avoid masking syphilis in cases of gonorrhoea dosage of penicillin should be either low or very high. The toxic effects of arsenic were overemphasized. Streptomycin, which was effective in non-venereal urethritis, was not as good as penicillin in the treatment of gonorrhoea. He had found the antihistamine drugs of some use in the treatment of interstitial keratitis.

Interference with Immunity

Dr. ARTHUR S. WIGFIELD (Worcester) emphasized that the relatively short six-weeks combined course of treatment with N.A.B., bismuth, and penicillin as prescribed in Liverpool carried less than a 2% failure rate. With this yardstick it was not necessary to treat hundreds of cases of early syphilis with newer and more intensive methods. Three failures should be sufficient to condemn a course. Intensive initial treatment interfered with immunity to syphilis. Clinical relapses following penicillin therapy alone occurred within the first nine months of the disease. He considered that the masking of syphilis by penicillin was less of a danger than was generally believed.

Dr. D. I. WILLIAMS (London) spoke on the value of B.A.L. in the treatment of arsenical and other metallic poisonings and especially of exfoliative dermatitis. The drug should be administered early; the necessary dosage was not yet settled. It should not be employed where there was any liver damage. There was a high incidence of sensitization to the drug. It was difficult to assess the published results, but they were certainly encouraging. He felt that B.A.L. should be given to all cases of arsenical intoxication except the mildest.

Dr. P. B. MUMFORD (Manchester) thought arsenical dermatitis was now rarely seen. The procaine employed with penicillin might cause sensitization reactions. Dr. A. O. FERGUSSON ROSS (Liverpool) referred to the early work with penicillin in the treatment of cases of secondary syphilis in Liverpool. He stressed the importance of care in the use of penicillin in late syphilis. Without preliminary medication it was dangerous in cardiovascular syphilis.

Colonel CLIFFORD MORGAN (U.S. Army) gave figures indicating the reduction in the incidence of venereal disease in the army in Europe. There was danger from concealed cases. Use was being made of the Career Guidance Council. Dr. J. T. INGRAM (Leeds) thought the development of some immunity in the patient was important. Penicillin was withheld until the middle of the period of treatment. Dr. A. MURRAY STUART (Portsmouth) thought that wives of men infected with gonorrhoea should be treated without waiting for confirmation of the diagnosis. He had found calcium thiosulphate of value in treating the toxic effects of arsenic. Dr. DONALD R. HUGGINS (Port of Spain, Trinidad) said that an effective short course of treatment for syphilis was essential to deal with the problem in the West Indies. Dr. J. P. G. ROGERSON (Shrewsbury) drew attention to the difficulties of the problem in small country communities. Patients could attend for treatment only once a week, because of distances and for economic reasons. He saw very little arsenical dermatitis.

The openers replied briefly to the points raised.

SECTIONS OF DISEASES OF THE CHEST AND TUBERCULOSIS AND OF PREVENTIVE MEDICINE

Thursday, July 20

Care of the Tuberculous Patient in the Home

With the president of the Section of Preventive Medicine, Professor W. M. FRAZER (Liverpool), in the chair, Professor F. R. G. HEAF (Cardiff) opened a discussion on the care of the tuberculous in the home. He drew attention to the lack of institutional facilities for the treatment of tuberculosis; the result of this was that 137,000 patients had to be treated in their own homes. The curative aspects of domiciliary treatment could be divided into two parts—pre-sanatorium and post-sanatorium. The success of pre-sanatorium treatment depended on the home conditions: when these were poor domiciliary treatment should not be attempted. Such patients should have priority for admission to a sanatorium. There must be co-operation between the chest physician and the general practitioner, and together they should teach the patient the importance of rest. The three essentials for successful domiciliary treatment were freedom from financial anxiety, facilities for rest, and a co-operative patient. Sympathetic help from the local health authority was also important. It had to be recognized that domiciliary treatment cost money, though it was cheaper than sanatorium treatment. A good ambulance service was necessary, and also a home-help service and facilities for occupational therapy. Active domiciliary treatment threw a great burden on the chest clinic, and the physician would need additional staff. Hospital beds for the treatment of complications were a necessity. Existing schemes proved that active domiciliary treatment could be successful. Collapse therapy should be used with care, and streptomycin should not be employed indiscriminately, because of the danger of spread of resistant organisms. An exception might be made in cases of tuberculous laryngitis with dysphagia and tuberculous tracheobronchitis. All general practitioners should consult the chest physician before giving streptomycin to their patients. During the pre-sanatorium period preventive measures should be instituted, and the education of the family was essential. Contacts should be examined and Mantoux-negative children vaccinated with B.C.G.

In the post-sanatorium period it was necessary to help the patient adapt himself to the change of environment from the sanatorium to the home. Prevention of the spread of infection and rehabilitation were the main objectives. The experience of village settlements, where serious tuberculosis in children is rare, showed that spread could be prevented.

Financial assistance and the finding of suitable occupations, including sheltered employment, were essential. Some of the money which would have been spent on these patients in hospital might be used to provide domiciliary treatment. But the spending of this money was the concern of the hospital board, and the local health authority was often disinclined to accept the financial burden which proper aftercare arrangements entailed. The reunion of the tuberculosis services was as essential to the anti-tuberculosis campaign as the provision of more nurses. Treatment must not be divided from prevention and aftercare, and hospital boards and local health authorities should find some means of co-operation, such as by the formation of local joint tuberculosis panels. Better still, the Act should be amended to provide a unified tuberculosis authority.

The Work of the Chest Clinic

Dr. R. GRENVILLE-MATHERS (Harrow, late of Wallasey) said that the chest clinic was now the major centre for the treatment of the tuberculous. Only selected cases suitable for active treatment should be admitted to the sanatorium, but there was a need for places where precautionary measures could be taught to other patients and where the deteriorating chronic patient could be looked after. Proper selection of patients would solve the sanatorium bed problem. There were dangers in instituting collapse therapy at home. In Wallasey the aim had been to put the available sanatorium beds to their maximum use. Patients were admitted for collapse therapy and discharged as soon as this was established, to continue their treatment at home. The co-operation of the general practitioners was secured, and by these means domiciliary treatment was successful if the home conditions were good. Mothers and housewives were unsuitable for home treatment. Home helps were required, but many patients were unable to afford the charge made by the local authority, and this penalized the patient who was having home treatment. The patient with a persistently positive sputum presented a major problem. Village settlements had pointed the way by showing that such a patient was not a danger if suitable conditions were provided. In the North Wirral area sputum-positive patients were given immediate priority for rehousing, and they were carefully trained in hygienic precautions and found suitable employment. A resettlement clinic which was attended by an officer from the Ministry of Labour had the task of selecting a suitable job for the patient, consideration being given both to his or her point of view of health and to the prevention of spread of the disease. Sixty-five per cent. of the children notified to this clinic had no known contact, showing that it was the unknown case of tuberculosis which was the danger.

Integration of the Tuberculosis Services

Dr. W. D. GRAY (Liverpool) said that the clinic physician was responsible for the care at home of all tuberculous persons,

before and after sanatorium treatment. He must know the home, and the family must be treated as a whole and contacts examined and re-examined. Co-operation with the general practitioners was essential, but tuberculosis was not a well-taught subject in medical schools and some doctors did not realize the importance of rest. Many patients did very well when they were able to rest at home, but, especially in industrial areas, accommodation for urgent cases and patients from poor homes was needed. Housewives were unable to rest at home, and the majority of families could not afford the local authority's charges for home help. Housing policy must be used in a preventive way. In the North Liverpool area, with a population of 300,000, there were 1,895 adult patients: 140 were awaiting admission to hospital, and of these 82 were able to rest in bed in a separate room (this included married couples who shared a room), 5 were able to rest in a room shared with others, 35 were unable to rest, and 28 were unwilling to rest. In the same area 51 patients were deteriorating at home, 302 were ambulant but unfit for work, 58 were fit but unemployed, and 920 were working. Diagnosis and treatment and prevention and aftercare should not be separated. Beds should be allocated on an agreed plan between sanatorium and clinic, taking into consideration social as well as medical needs. Sympathetic attention should be given to each individual case—every patient could be helped, although not all could be treated.

In the subsequent discussion Dr. L. M. JOHNSTON (Wallasey) mentioned the dangers of tobacco-smoking. Dr. E. G. SITA-LUMSDEN (Southend-on-Sea) advocated postural retention for patients having home treatment and the greater use of open-air shelters. Dr. J. K. B. WADDINGTON (Liverpool) mentioned the gulf between the general practitioner and the specialist service. The chest clinic should maintain contact with the practitioner and preach the gospel to him. Dr. J. GREENWOOD WILSON (Cardiff) stressed the need for amending legislation to provide free home helps for the tuberculous. He said that some local authorities had lost the use of occupational therapy workshops in hospitals taken over by the hospital boards and that some patients abused housing priority. Dr. O. F. FRAZER (Liverpool) said that streptomycin should not be given to the patient who was likely to have surgical treatment, and he warned against its indiscriminate use in the home. P.A.S. was comparatively harmless. Dr. WATSON (Chester) thought that the great importance of preventive work in tuberculosis should be reflected in the grading of physicians engaged in such work. Dr. J. L. LIVINGSTONE (London) suggested that the matrons of teaching hospitals should be instructed, possibly by a booklet, in the very small risk attached to nursing tuberculosis. Nevertheless the conditions of nursing in some hospital wards for advanced cases still needed improvement. Dr. C. H. C. TOUSSAINT (London) mentioned the importance of the work of the welfare officer, who could help the patient undergoing domiciliary treatment to have an easy mind. In the home postural treatment and absolute rest were the most successful measures. He supported Dr. Johnston in a dislike of tobacco.

SECTION OF GERIATRICS

Thursday, July 20

Activity in Advancing Years

With Dr. C. O. STALLYBRASS, the president, in the chair, the theme of activity in advancing years was introduced by Dr. MARJORY W. WARREN (London), who contrasted the results of continued inactivity of body and mind with those of activity. She emphasized both physical and psychological aspects, mentioning stiffness of joints, contractures, and flexion deformities of limbs and neck, as well as the mental atrophy which is so often found. Much incontinence could be attributed to actual laziness and bad habits. The diagnosis of senility or simple old age should be avoided at all costs, since it could hide a multitude of physical and mental lesions. At the end of her talk Dr. Warren showed a film illustrating her methods of rehabilitation in cases of hemiplegia and of double amputation through the thighs.

Mr. J. P. HERON (Liverpool) spoke on the orthopaedic aspect of activity for the aged. He urged the need to conserve and increase all bodily function as much as possible. The less limbs were immobilized by plaster the better. As for the use of skin traction in fracture treatment, it gave poor results. He emphasized the need for planned treatment from the first time of seeing the patient. Consultation with the anaesthetist before operation was often more helpful than the opinion of the physician. Curare could be of great value in producing muscle relaxation for surgery. It was of great importance to start mobilization of the patient as well as of the affected limb soon after operation. Manipulation was best performed under a general anaesthetic, not too much being attempted at one session. Mr. Heron ended his talk with a brief survey of common orthopaedic complaints met with in elderly patients, together with practical points concerning their management.

Dr. TREVOR H. HOWELL (London) spoke on the need to analyse the various kinds of pain which might be found in elderly patients suffering from different types of arthritis. He distinguished between synovial pain, capsular pain, and pain secondary to muscle spasm. The first would usually respond to tetraethylammonium bromide or methonium compounds, and was described as general, diffuse, and throbbing, with exacerbations. The second was sharp, stabbing, and localized in character. It could be relieved for a time by accurate injection with a local analgesic. The third, also sharp and stabbing, was associated with muscle spasm which could be relaxed by 0.5 mg. of neostigmine intramuscularly.

Dr. S. R. HIRSCH (Brussels) gave an account of the newer conceptions of arteriosclerosis. He pointed out how the clinical and pathological aspects differed and how the experimental approach had not yet met the needs of the clinician. After summarizing the aetiological factors, Dr. Hirsch mentioned the vasomotor and haemodynamic results of ischaemia, congestion, and tension, which might be clinically silent although pathologically established. He ended with a plea for the establishment of an investigation into the early signs and symptoms, so that prevention might be attempted for a disease which had no effective form of treatment. "This is the scourge of contemporary humanity," was his conclusion.

Dr. ROBERT M. EVANS (Liverpool) spoke on the subject of pulmonary fibrosis as a cause of diminished activity among the elderly. Chronic bronchitis, old tuberculosis, or bronchiectasis in this age group all had this factor in common. The main symptom was dyspnoea, to which wheezing, cough, and the onset of congestive heart failure were added. In the aged, hypertrophy of the right ventricle was prevented by coronary insufficiency. Hence prevention was essential as early as possible. Removal from known aetiological factors, depression of cough, and removal of irritants to the pharynx were all needed. It was necessary to cut short all attacks of bronchitis by antibiotics and antispasmodics before more damage to the lung took place. Too much rest in bed should be avoided or lung bases would get clogged with sticky mucus.

Dr. LOUIS CARP (New York) gave a most interesting address on operative mortality in geriatric surgery. He emphasized the need for the surgeon to be a good doctor as well as technically expert. After describing the work of the Goldwater Memorial Hospital in New York, he showed how the operative mortality in various clinics ranged from 7% to 17% according to the amount of emergency work undertaken. In his unit half the cases needed emergency surgery, and these cases had a 39% mortality during the past five years. Surgery of election showed this rate diminished very considerably. Bronchopneumonia, pulmonary oedema, and peritonitis were the chief fatal complications, with pyelonephritis as a main contributory cause. Dr. Carp emphasized the need for planned procedure and careful preparation before operation. Nitrogen imbalance, fluid lack, and anaemia in particular required special study. After a survey of the common surgical conditions which prevailed and the technical measures needed, he stressed the importance of early ambulation and the limitation of sedation. Finally, there was the need for a proper psychological approach to the patient, which could result in co-operation instead of fear, nervousness, and resistance.

SECTION OF MEDICAL GENETICS

Thursday, July 20

Genetics and Medical Practice

After taking the chair, the president, Dr. C. P. BLACKER, said that this first meeting devoted to medical genetics in the history of B.M.A. Annual Conferences owed its inception to Professor Arnold Sorsby. Owing to other commitments Professor Sorsby was unfortunately unable to attend, but he had sent a letter of good wishes.

Professor L. S. PENROSE (London), opening the discussion on the contribution of genetics to medical practice, said he thought the contribution of genetics was real though of limited usefulness. There were, however, two fields in which it was of especial value. One was serology and the other pathological chemistry. He looked forward to the time when the treatment of metabolic disorders would be helped by the application of genetic knowledge. He did not consider that there was much hope of reducing the number of bad genes in the population, but said that guidance on having children could be useful in individual cases. The most important task for the immediate future was the study of relatively common, and therefore important, conditions in whose causation a hereditary contribution was important. He stressed the need for ascertaining the morbidity rates by sex, age, etc., as the all-important prerequisite.

This was illustrated by studies on peptic ulcer and mammary cancer, in which the necessary basic figures for the population were first obtained. It could then be seen that the rate among brothers of sufferers from the first condition and among female relatives of sufferers from the second were about doubled as compared with rates in the general population.

Tests for Paternity

Dr. R. R. RACE (London) then discussed practical aspects of blood-group genetics. He mentioned the genetic simplicity of the subject and said that there were now eight independent systems of blood groups. The gene and the antigen might be almost the same thing, and the ultimate contribution to pure genetic theory might be great. He outlined the story of haemolytic disease and deplored the fact that girls were still, at least recently, being given transfusions or injections of whole blood in the attempt to protect against measles, without rhesus testing. The chance of a single incompatible transfusion or injection immunizing the patient permanently was 50%, and those so immunized stood a high chance of losing their first and subsequent babies if, as would be usual, they married an Rh-positive man.

On the subject of exclusion of paternity, he said that this country was very backward in its appreciation of the new knowledge. In Denmark the number officially tested was now 20,000. It was a great pity that Lord Merthyr's admirable Bill became a war casualty. It was now possible to exclude 62% of wrongful paternities, and in his experience half the paternities attributed were wrong. As 7,200 affiliation orders were made in a year and 2,000 men went to prison for non-payment, he thought that preventable injustice was being inflicted on a large scale. The majority of suspected mixings of babies at maternity hospitals could be cleared up by serological methods.

Genetic Clinic

Dr. J. A. FRASER ROBERTS (London) described a genetic clinic organized in connexion with the Institute of Child Health of the University of London, and held once a month at the Hospital for Sick Children, Great Ormond Street. Patients were referred by the physicians and surgeons to the hospital. While the proportion of the population needing genetic advice might be small, the numbers in any large city would be considerable.

Cases should be referred by the family doctor or a specialist, and all necessary investigations should already have been carried out. One man could give reasonable advice over the whole field except for genetic advice on mental disease (not mental deficiency), which should be provided by a psychiatrist who was also a geneticist. The chances should be explained, but the decision left to the persons concerned. In his experience it was possible to give advice adequate for the patient's needs in the great majority of instances. Much of the work consisted in reassuring those who had little to fear.

The discussion was summed up by Professor F. A. E. CREW, F.R.S. (Edinburgh), who on the basis of his long experience in genetics contrasted the work of the plant and animal breeder with that among human beings. He stressed the fact that at a genetic clinic the real patient was the unborn child. The doctor could not escape having the power to influence conduct, and this must be increasingly based on exact knowledge. He devoted his concluding remarks to the serious genetic implications of the use of radiation in industry and medicine. These beneficent activities could not only hurt individuals but were potent in regard to the well-being of future generations. Here was a new field of mutational prophylaxis which was to be based on genetic knowledge.

In the discussion that followed, Dr. WILLIAM N. PICKLES (Aysgarth) said that the general practitioner who had been long in one district saw clearly the baneful trend of hereditary disease—not of rare diseases such as had been mentioned that morning, but of common conditions such as hypertension and glycosuria. He described a remarkable family which contained 62 members of whom 23 had had rheumatic fever or unmistakable signs of mitral disease. It was for the G.P. to provide facts of this sort and for others more skilled to give advice on them. He pleaded for a greater interest in genetics by G.P.s and a close liaison between them and the geneticist.

Dr. MURIEL BARTON HALL (Liverpool) mentioned the difficulty in routine clinical practice of making use in the genetic field of relevant material which presented itself.

Dr. N. S. BARNETT (Liverpool) asked whether it was possible, if the "undesirable" type—for example, the achondroplastic dwarf—were allowed to breed and rebreed, that by mutation a type might emerge superior to the previously accepted standard of "fitness." Dr. FRASER ROBERTS said that there was little chance of this.

The president, Dr. BLACKER, and Professor CREW remarked on the general agreement among those present in their approach to these problems. This new Section had been inaugurated with some diffidence, but could look forward to a useful future.

SECTION OF NEUROLOGY

Thursday, July 20

The Diagnosis and Treatment of Pain in the Upper Limb

With the president, Sir HUGH CAIRNS, in the chair, Dr. M. J. MCARDLE (London) opened the session by referring to the considerable advances in knowledge of this subject during the last ten years. The diagnosis of "brachial neuritis" was rarely made to-day. In 1938 frequent reference was made to the scalenus syndrome as a cause of pain in the arm, but recently this had received less attention. The lesson had been drawn from our knowledge of lumbar disk lesions as a cause of sciatica, and greater interest was now taken in cervical disk lesions producing cervical root irritation. Practically all cases of pain in the arm were included under the following headings: disk root lesions, costoclavicular syndrome, acroparaesthesia, and fibrositis. Cervical root pain was of a constant character, being a nagging severe pain not intensified by abduction of the arm. There was tenderness of the muscles supplied by the affected root. Objective signs of a root lesion would be found on careful examination: objective sensory signs were minimal and motor changes were diagnostically the most useful.

Prolapsed cervical disks were usually those between the fifth and sixth or sixth and seventh vertebrae. Lateral flexion of the neck towards the side of the lesion might exaggerate the pain. Dr. McArdle referred to the small "neurocentral" joints whose importance had recently been emphasized by Dr. James Bull, and said that osteophyte formation from these joints, when arthritic, could compress and irritate a cervical root in its foramen. A prolapsed disk and an osteophyte were not very easy to differentiate as a cause of root pain. A sudden onset of symptoms favoured a disk lesion, and slow changes

osteoarthritis. *X*-ray examination might reveal the osteophyte formation. The differentiation was not very important, as treatment was the same. Diffuse osteoarthritis of the cervical spine did not commonly produce root irritability. Pressure at the cervico-brachial junction was the most controversial aspect of the subject. If there were no vasomotor changes it was not very easy to diagnose. "Proximal thenar atrophy" was sometimes caused by such pressure. Unaccustomed physical strain, such as the carrying of heavy weights, might produce temporary symptoms. Recent investigations had shown that costoclavicular compression (compression of the subclavian artery and the brachial plexus between the clavicle and the first rib) was impossible if there was no gross structural abnormality.

Acroparaesthesia was most often seen in women between the ages of 40 and 50 years and commonly woke them at night by intense burning sensations in the hands and arms, sometimes paroxysmal in character, and there was usually an unpleasant aching pain as well. Manual work during the day appeared to be a provocative factor. The syndrome ran a chronic fluctuating course from a few months to thirty years. It was very unusual in men. Dr. McArdle considered that the paraesthesia was due to nerve compression of some kind occurring at varying sites. Sometimes it was a median nerve compression in the carpal tunnel. He had had a dozen suspected cases of this in which surgical decompression of the median nerves had given uniformly good results. In other cases the ulnar nerve might be involved, and yet others were of very obscure aetiology. Our views in five to ten years' time would be very different from those of to-day.

Cervical Disk Lesions

Dr. M. KREMER (London) considered that in most cases symptoms due to a cervical disk lesion were insidious in onset. Sometimes a history of an antecedent stiff neck was obtained, but this was not common—not as common as the history of lumbago preceding sciatica. The root pain from a cervical disk lesion generally began at the root of the neck and spread laterally either anteriorly or posteriorly to the axillary fold, then down either the anterior or posterior aspect of the arm to the elbow. The pain usually paused for a time at the elbow. Very rarely the pain extended further below the wrist and into the fingers. The affected muscles became very tender. In left-sided cases coronary pain was sometimes simulated. Muscular spasm occurred in some cases. The head might be tilted towards the shoulder on the affected side. As a result of spasm and immobilization the condition of "frozen shoulder" might develop. By the time pain had reached the wrist paraesthesia had usually developed in the fingers. Sensory changes resulted in difficulties in picking up small objects. A visible flabbiness or atonia was often seen in affected muscles and there might be reflex losses. Some objective signs would invariably be found after a few weeks in all these cases of root lesion. The pain was of a very severe character. It was worse at night. Sleep might become impossible. Additional pain was caused by putting strains on muscles in spasm. Movements of the neck are commonly restricted. Patients would often seem to "turn in one piece." Even in the early stages of root lesions some pathognostic signs were generally to be found. For example, pressure vertically downwards on the head might produce root pain. In contrast, traction under the chin might give great relief; this was a most useful sign.

Dr. Kremer emphasized the importance of conservatism in treatment. More than 90% of cases became well spontaneously in six to ten weeks. The keynote of treatment was rest in bed. The three-quarters sitting position, properly supported, was best, though lying flat suited some patients better. Sandbags might be necessary to keep the head still, and the affected limb must be fully supported. Analgesic drugs should be freely given to relieve pain where necessary. The object was to secure complete rest in bed by obtaining relief of all pain by appropriate drugs. Manipulation under general anaesthesia was dangerous. The use of a neck-sling, with extension, was valuable for the relief of pain in some cases. If necessary a plastic or leather collar for the neck could be fitted, or, alternatively, a temporary collar could be made by the patient himself from a sheet of 1-in. orthopaedic rubber. Only a very small percentage of cases required operative treatment. Dr. Kremer referred to neuralgic amyotrophy as another cause of pain in the arm in young adults. Severe pain at the root of the neck and around the shoulder was present for 10 to 20 days. Then weakening and wasting of the affected muscles became noticeable. Later the pain disappeared, and recovery, partial or complete, slowly took place.

Radiological Features

Dr. J. W. D. BULL (London) described the radiological anatomy of the cervical spine, with particular reference to the structures bordering on the exit foramina of the vertebrae. He pointed out the importance of the small neurocentral joints which lay on the lateral aspects of the bodies of the third to seventh cervical vertebrae only; they also formed the anterior border of the exit foramina. He showed how, in cases of cervical disk degeneration these joints often showed signs of arthritis and osteophyte formation encroaching on the exit foramen. He felt that this feature was one of the factors in the production of brachial neuralgia. He stressed the puzzling absence of symptoms in some cases with marked radiological abnormalities and referred to our ignorance of many other factors concerned in causing root pains in the arm. He expressed the view—and other speakers agreed—that myelography was unnecessary in the diagnosis of cervical disk lesions.

Mr. W. R. HENDERSON (Leeds) said that an important point in the diagnosis of cervical disk lesions was that only one root was affected. He agreed that the treatment was mainly conservative and operation rarely needed. He spoke of the dangers of manipulation. Such treatment might occasionally result in sudden improvement but sometimes made the symptoms worse. Operative treatment was essential if there was compression of the spinal cord. Spinal tumour was an occasional cause of pain in the arm. Such tumours were generally extradural, benign, and removable if diagnosed early enough. Root pains from such tumours usually occurred over the shoulder and down the arm. There might, however, be very little root pain, and this added to the risk of misdiagnosis. There was a danger of overlooking the presence of removable tumours by considering prolapse of cervical disk as the cause in all cases of cervical root pain.

Mr. D. LLOYD GRIFFITHS (Manchester) spoke from the standpoint of the orthopaedic surgeon and stressed that the commonest cause of pain down the arm was something wrong with the shoulder. Among his cases, only one in five of pain in the arm was due to a cervical disk. The disk syndrome was easily recognizable, as was the shoulder syndrome. There were some cases, however, that could be very difficult to diagnose. The pains from a shoulder lesion were from soft tissues, the capsule, and surrounding tendons. In such cases not only might "frozen shoulder" develop but also "frozen hand," and after the pain had disappeared movements remained restricted. Many cases of rheumatoid arthritis in middle age began with pain in the neck and down the arm. In normal people the costoclavicular syndrome was of no importance, but it became very important when a large cervical rib was present. Unlike the lumbar region, in the cervical region osteoarthritis in the spine was common in cases of cervical disk lesions. Mr. Griffiths disagreed with Dr. Kremer and considered that a plaster-of-Paris jacket to fix the neck was more important than rest in bed. It could relieve pain dramatically. Lastly, referred pain—such as that of cardiac disease—should not be forgotten.

Mr. D. M. MORRISSEY (Birmingham) spoke of the costoclavicular or thoracic inlet syndrome. He considered that the loss of supraclavicular hollowing was a sign of a falling clavicle. This was particularly important in cases of cervical rib, which might become very prominent. He agreed with other speakers that alteration in the pulse volume was of little significance. Except in rare cases conservative treatment gave the best results. Nearly all patients recovered spontaneously. Operation might be required if a cervical rib gave rise to severe symptoms.

The Care of Paraplegics

In the afternoon the Section visited the spinal injury unit at the Southport Promenade Hospital. Mr. A. SUTCLIFFE KERR (Liverpool), in a preliminary address, stated that it was now not enough to keep all paraplegics alive. They must be rehabilitated

sufficiently to be able to go home. The treatment of their cases could be put in three categories: care of the renal tract, of the skin, and of the patient's mental outlook. A keen nursing staff was necessary. In the early stages paraplegics had to be turned every two hours to reduce the risk of bedsores. They might have to be nursed on their faces for long periods. Rehabilitation consisted largely in developing the muscles of the upper trunk and arms: these could largely replace those of the legs in relearning to walk. In the treatment of bedsores already present Mr. Kerr advised bland, not sticky, dressings, the excision of sloughs, and the use of full-thickness pedicle skin grafts where necessary. Stiff joints were a handicap, and joints should be kept healthy by physiotherapy. Mr. Kerr stressed that every patient with a lesion at the tenth dorsal segment or below should be able to walk. Spastic paraplegics were less easy to rehabilitate. It was important to have a resettlement unit in connexion with a spinal injury centre. Mr. J. COSBIE ROSS (Liverpool) and others spoke on the urological problems in paraplegics; in the relief of chronic retention of urine bladder-neck resection had important possibilities. Apparatus of an original character for training patients to walk was demonstrated.

SECTION OF RADIOLOGY

Thursday, July 20

Some Aspects of Bronchiectasis

With Dr. P. H. WHITAKER (Liverpool), a vice-president, in the chair, Dr. J. C. H. MACKENZIE (Leicester), opened the discussion on bronchiectasis, which, he said, was defined as a condition with dilatation of the bronchi. With the introduction of iodized oil as a contrast medium it had become possible to confirm the diagnosis during life.

In the medical literature there were no statistics of the incidence of this disease in a community. The figures from the Leicester Isolation Hospital and Chest Unit showed that the greatest incidence occurred up to the age of 15 years, and that the incidence in females was greater, particularly up to the age of 10. There was good co-operation between the Leicester chest unit and the Leicester City school medical service, and the figures for bronchiectasis among the school population in the city could be considered reliable. These cases of bronchiectasis were proved by bronchograms. The incidence was 2.9 per 1,000 school-children. The speaker suggested that the incidence would vary between communities, depending on social factors, the efficiency with which T.B.-positive cases were isolated from children, and the efficiency of chemotherapeutics and antibiotics.

The aetiological factors were mechanical forces—from traction and from distension from secretory pressure—and infection. Lander and Davidson had shown that traction forces within a collapsed segment produced dilatation of the bronchi, and they suggested that bronchiectasis was reversible. Lander in 1946 further suggested that in an incomplete bronchial stenosis the collapse was peripherally situated and the bronchus dilated, but that in complete obstruction dilatation might occur from secretory pressure. Infections which produced dilatation of the bronchi could be acute, subacute, or chronic. Acute destruction of the lung tissue occurred in Friedländer's pneumonia—non-specific suppurative pneumonitis and viral diseases associated with secondary infection. The subacute destructive changes occurred in tuberculosis when the upper lobes were particularly involved. The bulk of cases of bronchiectasis were chronic and invariably began with atelectasis of the lower lobes, either from an inflammatory cause or from glandular pressure, particularly tuberculous hilar adenitis. Bronchiectasis, however, did not necessarily follow atelectasis.

Pathological Changes

Dr. F. WHITWELL (Liverpool) said that his material had been collected from surgically resected lungs for bronchiectasis. He divided his cases into three main groups. First, the disease occurred in young people, usually following previous respiratory infections—particularly whooping-cough and measles. Here there were thickened, inflamed bronchi surrounded by zones of chronic interstitial pneumonia. No epithelial ulceration had been observed. These changes produced a compression of the bronchi and bronchioles from outside. The absence of alveolar filling and mucous plugs suggested that collapse was unimportant in the causation of bronchiectasis, and that the changes of importance were a peripheral bronchial obstruction.

In the second category was the saccular type of bronchiectasis, occurring in older people, usually without any previous respiratory infection. Sections showed an obvious saccule, which had a fibrous wall and was lined by metaplasic squamous epithelium. This was surrounded by normal alveoli, while the draining bronchus showed superficial bronchial inflammation with polypoid changes. These produced partial obstruction but no destruction of the bronchial wall. The third group of cases showed evidence of collapse with generalized bronchiectasis. The cause was enlarged hilar masses, usually tuberculous glands.

Lung Function

Dr. F. J. PRIME (Liverpool) described studies of lung function in a series of cases of bronchiectasis of varying severity in adults. The cases fell into two groups. In one function was but little affected: vital capacity, total lung capacity, and residual air were normal, but some degree of dysfunction was apparent in a reduced breathing reserve and minimal suboxygenation of the arterial blood. In the second group all measurements were grossly abnormal. Severe emphysema, shown by a high ratio of residual air to total lung capacity, was present in all, together with gross defects of intrapulmonary mixing of inspired with lung air. All the findings were such as would be expected from spreading fibrosis, with the production of focal or generalized emphysema.

In the general discussion the chairman, Dr. P. H. WHITAKER, said that in cases of bronchiectasis most of the damage was done in childhood, and early recognition of the disease was essential. Professor A. S. JOHNSTONE (Leeds) referred to the irregularity and kinking that might occur in the bronchi and bronchioles in an otherwise normal bronchogram, and suggested that these might be due to early bronchiectatic changes. Dr. R. J. KEATING (Wirral) noted that all cases of bronchiectasis did not fit into the groups that had been described, and suggested that a possible vascular disturbance might be associated. Dr. K. D. F. MORLE (Liverpool) referred to cases of reversible bronchiectasis which he had noted in healthy adults. These would appear to follow a segmental pneumonitis: bronchographic studies disclosed that return to normal occurred in from 10 days to 6 months. Mr. L. G. CRUIKSHANK (Leicester), Dr. J. E. WALLACE (Bognor Regis), Dr. R. FAWCITT (Ulverston), Dr. W. S. HOLDEN (Liverpool), Dr. G. B. LOCKE (Manchester), Dr. J. A. ROSS (Liverpool), and Dr. J. S. FULTON (Liverpool) also joined in the discussion. Replies were given by the opening speakers.

SECTIONS OF OTO-RHINO-LARYNGOLOGY AND RADIOLOGY

Thursday, July 20

Carcinoma of the Larynx

With the president of the Section of Oto-rhino-laryngology, Mr. I. SIMSON HALL (Edinburgh), in the chair, Dr. M. LEDERMAN (London) opened the discussion. Laryngeal cancer, he said, could be subdivided into supraglottic, glottic, and subglottic forms. The old classification into intrinsic and extrinsic groups should be abandoned. Of the radiotherapeutic methods of treatment available, external radiation by teleradium or high-voltage *x*-ray therapy was to be preferred, particularly the former if available. Radiation might be used for curative or palliative purposes or as a pre- or post-operative measure. The palliative value of radiotherapy was considerable. Pre- and post-operative radiation should be used with discretion.

Supraglottic tumours should be treated by radiotherapy, and subglottic tumours should be treated surgically. Radiotherapy should be used for all cases of glottic tumours suitable for laryngo-fissure, partial laryngectomy, or laryngectomy in which the cord was still mobile. Surgery should be reserved for

cases unsuitable for curative radiotherapy—that is, the more advanced, recurrent, or complicated cases. If the primary lesion was to be treated by radiation and nodes were present, these should be treated in the same way. If the primary lesion was healed and operable nodes appeared, block dissection should be performed. Inoperable nodes should receive palliative radiotherapy. "Prophylactic" irradiation of the neck was indicated for all supraglottic tumours. The results of teleradium treatment at the Royal Cancer Hospital, London, were as follows: 5-year survivals—operable cases, 16 out of 23 (70%); all cases, 18 out of 56 (32%). 3-year survivals—operable cases, 30 out of 46 (65%); all cases, 35 out of 96 (35%).

The discussion was continued by Mr. C. P. WILSON (London), who said that the factors to be considered in deciding upon the best method of treatment in intrinsic carcinoma of the larynx were the site of origin and extent of the growth, the mobility of the cord, the histological features, and the type of patient. The methods of treatment available were radiotherapeutic, limited surgical removal, radical surgical removal, and palliative treatment only. Early growths—with a rigid regard for the definition of an early growth—gave equally good results whether treated by radiotherapy or limited surgical removal by the laryngo-fissure route. Choice would depend upon the facilities available, the histological features, and the circumstances of the patient. More extensive unilateral growths were best treated by radiotherapy. Growths of the commissure should be treated by radiotherapy rather than by limited surgical removal. Growths with fixation of the cords were better treated by radical surgery than by radiotherapy. Advanced growths should be treated by radical surgery in comparatively fit patients and by palliative measures in the old and infirm. Subglottic and supraglottic growths were both less favourable than glottic growths for treatment either by surgery or by radiotherapy; if comparatively early, radiotherapy might be the better, but if there was fixation of the cord, or if the growth was of an extensive nature, radical surgery offered a more favourable prognosis. If the growth was of a well-differentiated keratinizing type there should be a bias in favour of surgery, but if the growth was of a non-keratinizing undifferentiated type the bias should be in favour of radiotherapy.

Recurrence after previous limited surgery or radiotherapy should be treated by radical surgery or palliative means alone. A second course of radiotherapy should be given only rarely. If glands were present the results were likely to be poor whatever treatment was adopted. If they were of differentiated type and were amenable to radical surgical removal this should be done, otherwise only radiotherapy or palliative treatment should be given.

Radiological Examination of the Larynx

Dr. J. J. STEVENSON (London) said that a thorough radiological examination of the larynx was not one which was carried out in many hospitals in this country. While it was a time-consuming investigation requiring a special technique, the information gathered from it did supplement that obtained by clinical methods. It was often helpful in determining the site of origin of a tumour, thus influencing the method of treatment and the prognosis. The extent, and particularly the lower borders, of laryngeal tumours were very difficult to assess by any other means. Indirect laryngoscopy sometimes failed to show subglottic extension of laryngeal growths which could be easily demonstrated by radiography. This method was also of help in assessing the nature of the tumour—as in the case of involvement of the epiglottis. To discover whether the growth was ulcerating, infiltrating, or proliferating was useful in planning the management of the case. The propagation of the tumour could be appreciated in most cases of spread into the pre-epiglottic space or into the pharynx. Finally, in cases subjected to radiotherapy it provided an objective record of the patients' response to treatment.

Dr. Stevenson said that his practice in all cases of carcinoma of the larynx was to take soft-tissue lateral radiographs and antero-posterior tomographs. Two lateral views were taken, one during normal respiration and one during phonation: as well as showing the topography, these helped to show the mobility of the laryngeal structures.

Mr. TERENCE CAWTHORNE (London) said that he regarded it as very satisfactory that surgeons and radiologists were in such close agreement about the treatment of this condition. He also referred to Dr. Constance Wood's work for the Medical Research Council and her successful results in the treatment of carcinoma of the larynx. Lieutenant-Colonel D. MACD. FRASER (Liverpool) asked how big a disability a total laryngectomy was to a labouring man who had to use considerable energy. Dr. S. C. SEN (New Delhi) asked whether the Coutard method of protracted treatment, as against high-intensity treatment, was still in favour amongst radiotherapists.

Combination of Surgery and Radiotherapy

The chairman, Mr. I. SIMSON HALL (Edinburgh), said that no surgical operation on the larynx was performed in his clinic between 1932 and 1942. The five-year recovery rate was 20%, *x*-ray therapy alone being used. This convinced him of the necessity for combining surgery with radiotherapy. Dr. J. S. FULTON (Liverpool), president of the Section of Radiology, said that he thought that the subject had been most adequately covered by the opening speakers. He was very much against the use of the single-dose method of radiation in the treatment of any form of cancer. He recommended continuous radiation for seven to ten days. He considered that radiation was not a successful method after surgery. In his opinion the discomfort caused to the patient by radiotherapy was much exaggerated.

Mr. WILSON, in replying, stressed that there was no conflict between laryngologists and radiotherapists. He thought that radiation was quite useless in the treatment of hyperkeratosis. He disagreed with Dr. Lederman that supraglottic tumours were not removable surgically. The modern operation of laryngectomy allowed even a labourer to do almost anything except swim. Dr. LEDERMAN also spoke in reply. He said that Coutard's method of low dosage had been almost universally abandoned.

SECTION OF TROPICAL MEDICINE

Thursday, July 20

Intestinal Parasites of Man in Great Britain

With Professor R. M. GORDON (Liverpool) in the chair, Professor J. J. C. BUCKLEY (London) spoke on helminthic infections of man in Great Britain. He said that on account of the climate and geographical position Britain's human helminthological fauna was restricted to relatively few of the 120-odd species known to occur in man. Those which did occur could be divided into those for which man was the normal host and those which were normally parasites of domesticated animals—e.g., dog and sheep—and which occurred in man only accidentally. Most of the "accidental" parasites came from the dog because it was a privileged household pet. They belonged mostly to the tapeworm family, and it should be recognized that tapeworms in dogs were dangerous and should be removed. *Dipylidium caninum* (which could be recognized by its segments) might be regarded as a trivial danger, but *Taenia multiceps* and *T. serialis* were more serious. The most dangerous of all was *Echinococcus granulosus*, which was easily overlooked in dogs, being very small, and which produced hydatid cysts if the eggs were swallowed. Fortunately human infections were now rare.

The "normal" parasites of man included four nematodes. Of these *Ascaris lumbricoides* and *Trichuris trichiura* were rarely important in Britain. *Enterobius vermicularis* (although in one sense it passed a "hand-to-mouth" existence) was very common. Recently it had been shown that the infection could be continued in the same host by a method named "retrofection," wherein eggs (scattered in the perianal region by the migrating female threadworm) hatched into larvae, which crawled back through the anus into the original host and attained maturity in the caecum. *Trichinella spiralis* had attracted attention during the war because of several outbreaks in widely separated localities in England and Wales. A pre-war survey had shown subclinical infection in only 2 out of 200 human diaphragms examined at necropsy, but a

survey made later in the war revealed trichiniasis in 10.8%. Women were infected more often than men.

The human tapeworms in Great Britain included *Taenia solium* and *T. saginata*, the latter appearing in beef as *Cysticercus bovis*. Routine meat inspection at abattoirs had shown a marked increase in the frequency of *C. bovis* in meat. A similar increase had been recorded from Denmark, and there it was accompanied by a rising incidence of the tapeworm in man. The general experience in Denmark had shown that meat inspection does not prevent transmission of the infection to human beings, since the cysts are often few and are easily overlooked. The other human tapeworm, *T. saginata*, which was derived from pigs, was fortunately now rare, partly because of efficient meat inspection, and partly because of the improved methods of keeping and feeding pigs.

Dr. C. A. HOARE (London) spoke on amoebiasis in Great Britain. His paper was published in full in last week's *Journal* (July 29, p. 238).

Treatment of Intestinal Helminths

Dr. R. F. VERE-HODGE (Tisbury, Wilts) spoke on the treatment of intestinal helminths. Before treatment a careful examination should be made to exclude debilitated subjects, the dose should not be repeated within ten days to avoid accumulation of the drug, and in children it was best to err on the side of underdosage. The commonest infestation was by threadworms. Treatment by gentian violet was usually effective, but relapse or reinfection often occurred. Younger children must be treated with quassia enemata on alternate days, probably for a month. In Britain ascaris never occurred in such overwhelming numbers as in China, where one patient might harbour as many as 2,000 worms. Santonin, being non-toxic, was the best drug to give, provided that oils, fats, and alkalis were avoided. A second treatment 4–7 days later might be necessary. The treatment of taenia was often difficult and uncertain. He recommended fluid diet and purgation for two days, then a dose of 90 min. (5.3 ml.) of liquid extract of male fern, followed half an hour later by magnesium sulphate. Carbon tetrachloride was also effective, but might be toxic. Hexylresorcinol was non-toxic but not very effective. For hookworm he recommended tetrachlorethylene plus oil of chenopodium. Strongyloides was usually resistant to treatment, but methylene blue had given promising results in a small series of cases.

Mr. R. B. GRIFFITHS (Liverpool) spoke on the incidence of *Cysticercus bovis* in Great Britain. Apparently this had recently become more common, and in 1949 routine inspection at the abattoirs had shown that 1.6 to 4.2% of the cattle slaughtered might contain it. It must be recognized that inspection at the abattoir could not detect all cases of infection, and the housewife must constitute a second line of defence by insisting on the thorough cooking of all meat. Apparently women were more liable to infections derived from meat than men were. The problem was of appreciable financial as well as medical importance, and a careful inquiry into the means of improving preventive measures to protect cattle from this infection would be well worth while.

Infestation in Children

Dr. R. C. MACKEITH (London) described the case of an infant with an ocular infection by *Enterobius vermicularis*. He also described a survey of the faeces of 142 children in London which showed 4 infected with *E. vermicularis* (perianal smears detected many other cases), 1 with *Trichuris trichiura*, 9 with *Giardia lamblia*, 1 with *Chilomastix mesnili*, 12 with *Entamoeba coli*, 3 with *Endolimax nana*, and 10 with *Blastocystis hominis*. Many of these infections occurred in the same patients. Other speakers in the discussion included Dr. L. E. NAPIER (London), Colonel W. H. HARGREAVES (London), Brigadier J. S. K. BOYD (London), Mr. P. L. LEROUX (London), and Dr. A. R. D. ADAMS (Liverpool). It was agreed that the higher rate of infections from meat among women was probably due to the contamination of the hands, though in some cases during the war trichiniasis had been contracted by eating raw sausages. In most cases *G. lamblia* was non-pathogenic, but many of the speakers considered that it might cause a peculiar chronic diarrhoea in certain patients.

SECTION OF ORTHOPAEDICS

Thursday, July 20

Treatment of the Short Leg

With the president, Dr. BRYAN L. MCFARLAND (Liverpool), in the chair, Mr. GORONWY E. THOMAS (Liverpool) opened a discussion on treatment of the short leg. Having described the common methods of alleviation by alteration to footwear and noting the possibility of disguising a very short limb within an extension prosthesis, Mr. Thomas reviewed methods of surgical correction either by lengthening the affected limb or by shortening the normal one. During the growth period of the *long* limb, operations could be performed for arresting growth by interfering with the epiphysial line by either permanent ablation (epiphysiodesis) or temporary interference by stapling; after the period of growth, shortening osteotomies, generally femoral, could be performed. The optimum period for the former was between the years of 8 and 11, and for osteotomy after the age of 12. He drew attention to the risks of operation, particularly of the ablation type, during the growth period, for late deformity had been reported in from 10% to 20% of cases. Discussing operations for the *short* leg, he said that sympathectomy to improve its vascularity and therefore its growth was unreliable and the improvement insignificant. When growth had ceased, lengthening of the short leg by osteotomy and distraction of either the femur or of the tibia and fibula was a procedure of complexity, and there were not unimportant possibilities of complications. The whole problem was difficult of decision, for, while leg shortening of the normal limb was less complicated and demanded a shorter period in hospital, it had the material disadvantage of general reduction in stature.

Mr. F. G. ALLAN (Birmingham), speaking about leg lengthening, discussed the problem on the basis of 101 cases. The tibia and fibula had been lengthened in 54 and the femur in 47, the largest number in the former group being for poliomyelitis and in the latter for shortening due to tuberculosis of the hip. The surgical technique and the complex apparatus used were described. Mr. Allan emphasized the necessity for a three-point hold above and below the step-cut osteotomies of the tibia and fibula, each comprising two transfixion pins and plaster-of-Paris. In the femur the maintenance of alignment was more difficult. The principles of the method were absolute fixation of the fragments, and completely controlled distraction, which was carried out very slowly. The possible complications included traction lesions in nerves, fracture of one or other of the step-cut osteotomies, mal-union, delayed union, weakness of lengthened muscles, osteomyelitis, traumatic arthritis, late fracture, pressure or stretch necrosis of skin, and circulatory disturbances.

Mr. A. L. EYRE-BROOK (Bristol), discussing surgical shortening, said that epiphysial arrest was more readily within the scope of the average surgeon and had few risks. Post-operative deformity had been a cause of criticism of the procedure, but he felt that this was minimized by greater thoroughness in the process of ablation of the epiphysial line. Besides the insertion of grafts across each side of the epiphyses, above and below the knee, it was necessary to excise a large section of the epiphysial cartilage between the grafts. Surgical shortening was the preferable approach to all patients in the older age group with the exception of a small number who were unwilling or who could ill afford to sacrifice any height. It was a safe procedure, quick in its results. It was best done in the femur, and as much as 4 in. (10 cm.) of shortening could thus be obtained with full return of knee movements and muscular control within three to five months.

In the subsequent discussion, Mr. H. OSMOND-CLARKE (London) noted the possibilities which were being explored in Sweden to improve the vascularity of the short limb, and therefore growth, by the production of an arteriovenous fistula with ligation of the main vein on the proximal side. He also stated that insufficient attention was being paid to the psychological problems of the patient in whom shortening a normal limb was contemplated. While in the adult this could be decided by the individual more readily, surgeons were assuming a very serious responsibility in committing a child to a future of psychological stress associated with shortened stature.

Mr. D. WAINWRIGHT (Newcastle, Staffs) described an elongating Thomas splint on which the limb was supported during bone lengthening of the femur, for which he advocated an oblique osteotomy from the region of the lesser trochanter downwards and outwards. Mr. H. J. SEDDON (London) and Mr. B. L. MCFARLAND, the president, both stressed the importance of segregating such cases in the hands of a few people prepared to master the complex technique involved.

Acute Osteomyelitis

Professor WALTER MERCER (Edinburgh) noted the beneficial effect which the use of modern chemotherapeutic drugs had had on acute osteomyelitis. There were still the problems of early diagnosis, the best use of penicillin, and the indications for surgery. The responsibility of general practitioners was very great in the early recognition of osteomyelitis, for the cure of the disease depended on the start of antibiotic treatment within five days of onset. After that, abscess formation occurred in spite of penicillin, and after ten days all cases required some intervention. The significant symptom was pain and the conspicuous sign was bone tenderness. Radiographs at this stage were valueless.

In treatment, the penicillin blood level must never fall below 0.1 unit per ml. It was necessary to give a large initial dose of 200,000 units followed by 50,000 units three-hourly in order to ensure that organisms shut away in the dense bony tissues were dealt with. He was also satisfied with giving daily injections of 300,000 units of procaine penicillin and 100,000 units of sodium penicillin with aluminium stearate in arachis oil. He did not approve of the fantastic high dosage sometimes given. It had been suggested that the bactericidal effect might be reduced thus. Penicillin-resistant organisms, of which there were between 5% and 10%, detected after 48–72 hours' treatment might require "aureomycin," with a dose of 10–60 mg. per kilogram body weight orally per day.

This treatment still necessitated immobilization of the limb, general supportive measures, and, if abscesses developed, their prompt evacuation. In such cases after ten days operation was almost always necessary—drilling of the bone and primary closure, penicillin being instilled into the wound.

Mr. DENIS BROWNE (London) agreed that early operation should be avoided, and advocated the aspiration of abscess. Mr. F. C. DWYER (Liverpool) felt that it was better if in doubt to open the medullary cavity rather than wait for destruction.

Hidden Dislocations

Mr. H. OSMOND-CLARKE (London) discussed a group of injuries the diagnosis of which might readily be missed unless care was exercised to temper the evidence of radiography by proper use of clinical acumen. Most frank dislocations were easy to recognize, but there were some which might escape notice until the time for successful treatment by simple means had passed. Among such lesions were persistent dislocation of slight degree and lesions of the deep joints. Some dislocations reduced spontaneously but left important soft-tissue damage—particularly, for example, in the ankle after a rupture of the external lateral ligaments and resulting inversion subluxation; in the knee with rupture of the collateral ligaments; and in the neck, where subluxation might be shown only when the neck was in forward flexion. Such cases were often being diagnosed for a long period after injury as hysterical. If they were recognized early, adequate immobilization would produce a stable joint. If clinical signs suggested these more serious lesions, a negative *x*-ray examination should be checked repeatedly. The question was asked whether simple plaster immobilization was adequate for the treatment of a complete ligament rupture at the knee. Mr. Osmond-Clarke agreed that, based upon one reported group of 60 cases of internal lateral ligament rupture, these should always be explored surgically.

Supracondylar Fracture of the Humerus

Mr. F. W. HOLDSWORTH (Sheffield), discussing supracondylar fracture of the humerus, mainly in children, remarked on the anxiety which had affected most surgeons because of the possibility of late deformity and loss of movement. He noted the difficulties of accurate reduction. They had tended to lead surgeons in America to perform open operation, and in Britain to carry out repeated manipulations. Discussing particularly transverse fractures, he noted that the most difficult to reduce was that through the condyles, in which reduction was often a matter of obtaining a knife-edge balance. Stability was almost impossible without some rotatory deformity. Some of the worst results were achieved by open operation and fixation.

The speaker had recently reviewed a considerable group of old cases, and his conclusion was that these fractures gave good results regularly by a single manipulation, with maximal correction, the use of collar-and-cuff fixation, and then gradual mobilization. Some degree of displacement after manipulation need not cause any great anxiety for the ultimate result. No advantage was obtained by the use of posterior plaster supports. A year must pass before assessment was possible. But he had found that the anterior spike from the upper fragment, which was due to the stabilizing rotatory displacement, was of no importance, for it was lost by remoulding later, and this process also tended to bring the lower articular surface of the humerus into normal alignment. In adults, T-shaped fractures also did not need absolute anatomical reduction.

Ischaemic contractures were always due to arterial damage at the time of injury, and required exploration of the artery. Fractures with displacement of the capitellum required operative replacement of the fragment and simple immobilization with the elbow in extension and pronation without internal fixation. Fractures of the internal condyle required no special treatment unless incarcerated within the joint.

Trochanteric Fractures of the Femur

Mr. NORMAN W. ROBERTS (Liverpool) discussed the results of 50 cases of trochanteric fracture of the femur, of which 35 had received operative reduction and fixation with a two-piece nail plate. There was no operative mortality. The method gave at least as good results as conservative treatment by immobilization and traction in bed, and at the same time gave these results with a shorter period in hospital and an easier convalescence. He did not operate on all such cases, for there were some which were entirely stable and did well by conservative means. The average age of his patients was 62, but he had operated on a certain number of young people. A particular indication was in pregnant women, where early activity was essential. There were certain types of subtrochanteric fracture where the nail plate provided a very satisfactory alternative to the less desirable Küntscher nail. He emphasized the need to impact the fracture in all cases when applying the device.

Clinical Demonstration

A clinical meeting was held at the Royal Infirmary, Liverpool, on Friday, July 21, at which the president, Mr. B. L. MCFARLAND, presented a case of arthroplasty of the jaw for ankylosis. He mentioned the technical difficulties which distortion of bony outline caused. Cases were shown in which patellectomy had been done for recurrent dislocation, and in which plastic reconstruction of the quadriceps had realigned the pull on the tibia (the point of the procedure being that such patellae were always degenerate). He also demonstrated the first case of congenital pseudarthrosis of the tibia on which he had operated, 17 years ago, by his "by-pass" method of bone grafting. The growth of the tibia and remoulding from the original deformity to a straight bone were remarkable.

Mr. F. C. DWYER (Liverpool) presented cases of transplantation of the ulnar nerve, including two cases of leprosy in which fibrotic shortening of the nerve had occurred. He also demonstrated a case of Madelung's deformity due to traumatic arrest of growth.

Mr. P. B. MORONEY (Liverpool) presented an example of "railings" fracture. These injuries, he pointed out, occurred in children who fell from railings and twisted their lower legs into severe adduction at the ankle, the lower epiphysial plate being split by the "anvil" action of the astragalus, producing premature fusion and severe late varus deformity. Correction by osteotomy was performed.

Mr. R. P. OSBORNE (Liverpool) showed cases of leg lengthening.

SECTION OF SURGERY

Friday, July 21

Burns

With the president, Professor CHARLES WELLS (Liverpool), in the chair, the meeting was opened by Mr. ROWLAND P. OSBORNE (Liverpool), who said that, as he had been working in co-operation with Mr. J. P. Reidy at Stoke Mandeville, it was his purpose to deal with the treatment up to the skin-grafting stage and to leave Mr. Reidy to continue from that point. Mr. Osborne began by emphasizing the very great importance of preventive measures and the need for special precautions in the case of children and epileptics. The use of fireguards and the proper placing of electric fires could do much to prevent the distressing incidence of burns. Turning to the question of burns centres, Mr. Osborne said he did not think it would be an economic or practicable proposition to establish many big centres, but he believed that by the simple modification of existing ward accommodation much could be done to provide proper dressing-rooms without sacrifice of too much space.

Mr. Osborne first discussed the problems of local treatment. In the initial process of cleansing the burnt area nothing should be applied which would damage the remaining epithelial elements. The first-aid dressing should consist in the application of the cleanest material available, and clothing should not be cut away. When the patient had reached hospital it was often best to delay the local treatment for some time in those cases requiring urgent and extensive resuscitation. It was their practice to undertake the first dressing in the theatre with full aseptic ritual and under general anaesthesia. The area was gently cleansed with a 1% "cetavlon" solution, and they then generally preferred the use of a Bunyan-Stannard envelope for limb burns, or, alternatively, the use of penicillin cream containing 400 units per gramme. In the latter instance the application of some pressure to the dressing was of importance, but it was not always easy to do this properly, and elevation of the limb was a simpler way of checking oedema. The speaker did not favour the use of plaster-of-Paris other than as a means of lightly splinting the limbs in children. Where dressings were used they should be applied with the greatest care and so fixed that they could remain securely in place for a long time; generally they were not disturbed for 10–14 days, and the only indications for changing them before this were: (1) because the dressing had shifted; (2) because exudate had soaked through and provided a passage for infection, or (3) because of fever, pain, or severe constitutional disturbance. Many superficial burns would be healed or nearly healed after 14 days, and in areas of full-thickness burn sloughs should then be removed and early grafting undertaken. Mr. Osborne referred to the importance of having a clean and flat granulating area to graft on, but he emphasized that it was sometimes justifiable and imperative to apply "postage-stamp" grafts to an infected area, and in any case they always used these "postage stamps" rather than sheets of skin. Concluding his discussion of local treatment, he referred to the use of saline baths, a method which was applicable only where expense was no object and a big team was available, and he stressed the need for careful bacteriological examinations and sensitivity tests, so that bacteriostatic and antibiotic agents could be intelligently used. He also mentioned the early excision of localized deep burns. In referring to the problems of general care, the speaker said that time would not permit more than a brief survey of circulatory restoration, the avoidance and control of anaemia, and the difficulties of correcting those profound metabolic disturbances which occurred in severe cases. Attention to the latter two factors, in particular, was an essential prerequisite to control of infection.

Skin Grafting

The discussion was continued by Mr. J. P. REIDY (London and Stoke Mandeville), who considered the patient from the stage when his burn was ready for the application of skin. Early skin cover of areas of deep loss reduced toxaemia, promoted healing, and restored function. Autogenous grafting of "postage stamps" cut from a thin sheet of skin was the most certain and economical method. Pinch grafts certainly had no place in treatment, for they were less likely to take and could leave a most unsightly donor area which was of no further use for provision of skin. Mr. Reidy said that, although homogenous grafts were able to survive only for a short time, homogenous grafting was of the greatest value as a temporary measure in many cases in which more than 40% of the body area had been burned. He then referred to the "high priority areas"—eyelids, hands, and flexures—all of which should be grafted at the earliest possible moment. In the case of the hand it was absolutely essential to maintain it in a position of function while healing occurred. Donor areas should be chosen with great care, and every effort should be made to use the maximum amount of each donor site in the most economical manner possible. Mr. Reidy concluded his remarks on early grafting by brief reference to the causes of failure and the occasional value of refrigerated grafts. On the subject of later repair he referred to the use of Wolfe grafts and flaps and to the problems of keloid scarring, illustrating his points by reference to a number of photographs.

Treatment by Exposure

Mr. A. B. WALLACE (Edinburgh) described the problems of controlled fluid replacement and his own method of treatment by exposure. He referred to the significance of pallor, thirst, and restlessness as evidence of incipient oligaemic shock, and explained the principles and methods of fluid replacement. In his own unit they had prepared tables which gave detailed guidance in this therapy at different ages and in burns of different extent, and these formulae gave considerable help to the junior medical and nursing staff in the care of the case. Mr. Wallace said that he was a great believer in keeping the burnt surface dry, and, having found that burns treated by pressure were much more readily healed when they remained dry, he was emboldened to try the treatment of cases by exposure to the air of the ward. After a careful ritual cleansing essentially similar to that mentioned by Mr. Osborne (although often conducted under premedication only), the burnt area was liberally insufflated with penicillin-lactose powder. This insufflation was continued four-hourly in the ward until the area was crusted over; this usually took 48 to 72 hours. He had used this method initially in children, and he emphasized the freedom from pain, marked lack of constitutional disturbance, low fever, and good progress. Although these surfaces were exposed to the full bacterial contamination of a general ward he had not had a case of infection with a β-haemolytic streptococcus, proteus, or *Ps. pyocyanea* in two years, and this was despite the fact that Petri dishes exposed in the ward were liberally contaminated by these organisms. Mr. Wallace illustrated the application of this method in various cases and concluded by showing a coloured film on exposure treatment of a superficial burn of the perineum and buttocks.

Dr. HERBERT M. BATTINGER (Gary, Indiana) said that as he was in such considerable measure of agreement with the two opening speakers he did not propose to burden the meeting with his full paper. He then selected the more important points for elaboration and said that he was a firm believer in the proper use of pressure dressings and elevation of the affected part. It was his practice to give one part of blood to every two parts of plasma in the early treatment, and he rarely gave much intravenous fluid after the first 36 hours. Dressings were left for 12 to 14 days, and he then performed a delayed excision of the sloughs and grafting, or else applied pressure dressings for a few more days if it was a superficial burn which had not yet healed. He believed in using sheets of skin and had not tried "postage-stamp" grafts. He referred to the use of high-calorie and high-protein diets, the administration of vitamins, and the need for keeping the haemoglobin at not less than 85%. Commenting on the exposure method of treatment, he said that this was new to him, and, although he was quite impressed, he felt that the superficial burns shown in Mr. Wallace's film might have healed equally well under any application, even cabbage leaves.

In the general discussion Mr. JOHN A. SHEPHERD (Liverpool) mentioned the dangers of morphine in some of these cases, the

importance of avoiding all sticky dressings, and the treatment of shock. In the latter connexion he believed that there was a great danger in using such tables of fluid replacement as Mr. Wallace had mentioned. He also thought that laboratory investigation with haematocrit readings was often difficult, and he preferred to rely on clinical judgment in giving his intravenous fluids. Mr. R. S. MURLEY (London) said that, as one who had been privileged to see Mr. Wallace's patients in the Edinburgh Children's Hospital, he would like to underline various points in this method. Many who had neither seen nor tried it were far too ready to condemn this very simple and eminently satisfactory method. He could confirm the remarkable general well-being of these patients and the absence of infection. Although some had said that this was a method which was likely to be difficult to apply in adult cases or in deep burns, he did not believe that this was so. In wartime, or in the treatment of large numbers of cases, the method would certainly be of the greatest value. Mr. Murley said that he could not agree with Mr. Shepherd's remarks about judging fluid therapy on clinical grounds: it was necessary to have some basic plan of campaign if one was to avoid doing great harm to some of these patients.

Treatment of Severe Burns

Miss ISABELLA FORSHALL (Liverpool) said that she was disappointed that none of the opening speakers had shown a picture of a really severe burn, and she would have liked to hear more about the burnt hand. She wondered whether the results with exposure were really much better than they had formerly obtained with tannic acid and other similar agents. It had seemed to her that relatively inefficiently cut skin grafts of varying thickness took better than carefully cut ones. Mr. R. B. WELBOURN (Liverpool) said that Mr. Osborne did not seem to regard infection as a major problem. He would like to know if the opener agreed with the practice of grafting on an infected surface to save time. He thought that somebody should emphasize the dangers of serum jaundice, for the previous speakers had all spoken of using plasma and had not mentioned the possibility of this serious complication. Surely plasma substitutes were advisable. Finally, he was not clear whether Mr. Wallace applied dressings after grafting.

The chairman, before calling on the first two speakers to reply, asked Mr. Wallace to answer some of these questions. Mr. WALLACE regretted that he had shown no severe cases, for he had a number of photographs of such cases with him and had been unable to show them in the short time available. He went on to describe some of the methods, such as the use of a special bed, by which he had treated very extensive burns by the exposure method. He completely disagreed with Miss Forshall about tannic acid and gentian violet, both of which damaged the burnt area, while the latter was a protoplasmic poison which delayed healing. In reply to Mr. Welbourn, he stated that he treated his cases after grafting in an orthodox manner. Mr. REIDY, in reply, said that he strongly disagreed with Mr. Shepherd's remarks about basing fluid therapy on clinical impression, though he agreed with his comments on the dangers of morphine. It was naturally justifiable to graft on an infected area provided that infection had been properly reduced beforehand. Miss Forshall had said that grafts of varying thickness might take better, but he did not know how she had formed this impression, since thin grafts of even thickness certainly took much better. He always cut his grafts with a Humby knife and had given up use of the dermatome for this purpose. He had not said more about burnt hands because he had purposely limited his remarks to the underlying principles of maintaining function, since in other respects there were few fundamental differences in treatment. Like Mr. Wallace, he could only mention tannic acid in order to condemn it.

Mr. OSBORNE pointed out that it had been hoped to get Sir Archibald McIndoe to open this discussion, and he regretted that the meeting had not had the privilege of hearing him. Mr. Osborne thought a basic plan of fluid therapy was quite essential. Haematocrit readings were not really so difficult, especially if one used capillary blood, as was the practice at Birmingham. A previous speaker had said that anaemia could be entirely prevented, but this was certainly not true, since it was, unfortunately, an inevitable development in severe burns and could be corrected only by frequent transfusions of fresh blood. In burns of the hand the important points were early movement, early removal of sloughs, and early grafting. He thought that the patient's own work was altogether preferable to remedial occupational therapy. Contrary to Mr. Welbourn's remarks, he did regard infection as a major problem: it was exceedingly difficult to render a surface sterile and almost impossible to keep it so, but luckily one could graft successfully without eradicating all infection. He concluded by showing pictures of some massive burns and briefly mentioned a useful method of applying alternate strips of autogenous and homogenous skin grafts in such cases. The latter method had been developed by Mr. L. M. Rouillard at St. Albans.

The chairman, Professor WELLS, then thanked the opening speakers for their contribution to what had been a very interesting and valuable discussion, and he especially thanked Dr. Herbert Battinger for having come so far for this meeting and for having been so courteous and considerate in cutting his paper down to an absolute minimum.

SECTION OF CHILD HEALTH

Friday, July 21

Epidemiology in Relation to Child Health

After thanking officers of the Section for their assistance, the president, Professor NORMAN B. CAPON (Liverpool), invited Dr. WILFRID SHELDON (London) to take the chair. Professor S. G. GRAHAM (Glasgow) opened the discussion with a paper on infection in the maternity hospital. He pointed out that the behaviour of infection in the newly born differed from that in older children and adults. The incidence of infection in the newly born was difficult to assess, but there was reason to believe it was highest in teaching hospitals, where premature deaths were more frequent. Necropsies revealed that approximately only 50% of infections were detected during life by experienced clinicians. Endogenous infection might explain the greater liability of the small premature infant to develop infection. Approximately 25% of the neonatal mortality was associated with infection. Professor Graham stated that the increase in institutional midwifery coupled with the failure of hospital construction to keep pace with demands made for greater risk of infection. The risks were less, and the possibility of epidemics did not exist in domiciliary practice. The greatest hazard in hospital arose from the herding of infants in ill-equipped and poorly ventilated rooms.

Neonatal Infections

Neonatal infections in a nursery were all potentially dangerous. In general, conjunctivitis, pemphigus, and thrush did not contribute materially to the neonatal death rate. Some sticky eyes were sterile, but *Staphylococcus albus* was frequently found and was probably pathogenic. Thrush was almost endemic in many nurseries, and had increased in frequency, though there had been no corresponding increase in monilia infection among mothers. Among major infections the aetiology of epidemic diarrhoea remained uncertain. Incrimination of special types of *Bact. coli* awaited final proof or disproof. Treatment of serious infections was on the whole unsatisfactory. Despite conflicting reports concerning their value, there was a place for the sulphonamides and penicillin, and there was justification for believing that there was a future for "aureomycin" and "chloromycetin." There was need to differentiate the so-called pneumonia arising from the aspiration of irritant amniotic fluids and the infective pneumonia of bacterial origin. A rigid regime designed to prevent the spread of infection constituted the essence of treatment. The prevention of prematurity required further study, and attention must be focused on social factors which contributed to the major problem of infection in the newly born.

Tuberculosis in the Home

Introducing Dr. W. N. PICKLES (Aysgarth), the chairman congratulated him on the honorary degree of D.Sc. recently conferred on him by the University of Leeds. Dr. Pickles's paper dealt with infection in the private house. In vivid terms he described instances known to him personally of tuberculous infection contracted by infants and children from relatives and elders in the household. He made a moving appeal for full appreciation by doctor and public that tuberculosis was our most important infectious disease. He reinforced his argument by contrasting the great care exercised in isolating scarlet fever, and by illustrating from records compiled during a long experience of general practice the providentially small death rate arising from the exanthemata and other diseases of an infectious nature.

Dr. Pickles gave it as his conviction that infectious diseases other than tuberculosis were introduced to the home by the school-child, and the method of transmission was usually by droplet infection. During the war evacuation was instrumental in bringing infection into rural reception areas, but not on the scale anticipated by many. Measles and chicken-pox were easily traced to their source in country districts, and Dr. Pickles suggested that in contradistinction to whooping-cough they need not occasion too much concern. Poliomyelitis he described as a seemingly insoluble problem of the future. Tuberculosis was the infectious disease of first importance; it should, with a view to control, have reserved for it their main resources and hospital beds.

Infection in the Hospital Ward

Dr. R. McL. TODD (Liverpool) discussed infection in the hospital ward. In his introduction he referred to reports on the subject published by the Medical Research Council (1944) and the British Paediatric Association (Watkins, 1949). Cross-infection was commonest in wards admitting infants of less than 12 months of age. Spread was by contact, droplet infection, or infected dust. Ideally every child admitted to a children's hospital should be isolated until proved non-infectious.

Dr. Todd outlined the procedures followed and the results obtained in 1949 in controlling infection at Alder Hey Hospital, which admitted infants and children up to the age of 15 years suffering from medical and surgical conditions, acute and long-term. Some wards were open: others were of the cubicle type. The average number of beds occupied was 586. In the open wards there were outbreaks of dysentery (61), measles (11), and chicken-pox (7). Medical wards in which Sonne dysentery developed were closed for all admissions until three negative rectal swabs had been obtained from all patients. When measles occurred all patients were given serum (if available), and until the end of the quarantine period only patients with a history of measles were admitted. In the cubicle wards some babies admitted for other symptoms developed diarrhoea and vomiting. The isolation of α and β coli proved a valuable indication of cross-infection. Instances were described of infection following intravenous infusions.

Summarizing, Dr. Todd gave the following as factors affecting the incidence of hospital infection and cross-infection: ward architecture; the standard and adequacy of nursing service throughout the 24 hours; methods of food preparation; aseptic technique; standards of toilet and hygiene; and ward cleaning procedures. There was reason to believe that vacuum cleaners used where floors were not oiled were as effective in reducing the spread of infection as the method of oiling floors and using sweeping brushes.

Infections in Nurseries

Dr. K. M. HIRST (London) continued the discussion with a contribution on infections in nurseries. She referred to the two principal groups of infections—respiratory catarrh and intestinal infection. The incidence of respiratory catarrh among children attending day nurseries was higher than that among children of comparable age not attending nurseries. Symptoms occurred at all ages but especially in children between the ages of 2 and 3 years. Spread of respiratory infection in nurseries could not be wholly prevented if the children were to lead a normal life. Little was known concerning the long-term significance of those minor respiratory conditions which might in any event be contracted during school life but which in nurseries developed earlier. There was a need for a follow-up of nursery children, and in particular of those children who had not stayed the course and had attended for only a short period.

Discussing intestinal infections, Dr. Hirst advocated the exclusion of young babies from nurseries because of the potential danger of enteritis. Food-poisoning was relatively uncommon. Many nurseries suffered from such disadvantages as lack of sink provision, a poor hot-water supply, inadequate draining and drying facilities, and domestic workers who required constant close supervision. For the washing of dishes and cutlery satisfactory results were obtained with the use of detergents followed by immersion in really hot water. The use of hypochlorites required care in the matter of "dosage." Sonne dysentery was the source of greatest trouble and was liable to involve the staff. Trial of chemoprophylaxis was justifiable where medical examination could be maintained and where laboratory services were available. The susceptibility of young members of staff entailed the close supervision of their general state of health. The risk of infection was such that it should be taken into consideration when nursery policy was being formulated.

A paper on infections in schools was given by Dr. J. C. RYLE (Shrewsbury). The conditions he described consisted of a group of specific infections, and a larger group of non-specific infections, including influenza and tonsillitis. Virus influenza had an average attack rate of 4% per term. Streptococcal infections had an attack rate of 6.4% and a high carrier rate. Influenza and streptococcal infections accounted for 40% of non-specific infections in school. Common colds accounted for 50%. The remaining 10% was generally diagnosed as P.U.O. and was composed of several entities which included abortive forms of virus diseases (glandular fever, poliomyelitis, and probably infective hepatitis), which played a small but important part.

Routine Preventive Measures

General discussion of the papers was opened by Dr. W. E. CROSBIE (Liverpool), who stressed two aspects of cross-infection in hospital—routine procedures to prevent spread of unrecognized infection and steps to control spread of manifest infection. Essentials of routine were adequate ventilation, avoidance of overcrowding, and medical examination on admission, with special attention to cases off the waiting-list. Manifest infection called for removal of the patient, search for carriers, and ascertainment (with immunization where applicable) of susceptibles. An appointment system reduced spread of infection. Administrative and medical staff should recognize the key importance of nursing staff. Dr. J. D. HAY (Liverpool) supported earlier views concerning the limited value of hypochlorites as sterilizing agents. Dr. G. SLOT (London) urged that sight be not lost of the social background to the subjects under discussion. Many children had no bed to themselves. He referred to the sense of false security arising from faulty mask technique in hospital. Considering visitation of patients, Professor CAPON asked for common-sense consideration of a child's human needs. Professor WILFRID GAISFORD (Manchester) gave the retention of babies with their mothers in lying-in wards as a method of reducing infection. He favoured the immunization at an early age of all infants against pertussis, and advocated sulphonamide therapy in appropriate daily doses in the winter as a form of prophylaxis against respiratory infection in infancy.

Dr. WILFRID SHELDON (London) spoke of his conviction that the incidence of infection was not increased where visitors to hospitals were allowed. He deprecated the unnecessary retention in hospital of healthy children, and urged that patients and relatives be educated into an understanding of higher hygienic standards. Accepting that a case might exist for day nurseries at the present time, Dr. Sheldon submitted that they should not be continued a day longer than absolutely necessary.

SECTION OF GERIATRICS

Friday, July 21

Hospital and General Practitioner

With Dr. MARJORY W. WARREN, a vice-president, in the chair, Dr. C. T. ANDREWS (Truro) opened the discussion on linkage between the hospital service and the general practitioner in the care of the aged sick. The problem of co-ordination was difficult, he said, because of the increase in the aged section of the population, the inadequate hospital accommodation, strain on the general practitioner, and various social problems. He showed that 41% of all hospital patients in Cornwall on a certain day were over 60 years old. Many old folk should be treated in their own homes rather than in hospital beds, which were over twice as costly to maintain as in 1939. Co-ordination between general practitioners and hospital was needed at three levels. First, in the geriatric unit and its long-stay annexe; secondly, at the cottage hospital, where doctors could care for their own aged patients with consultant advice; and, finally, by domiciliary consultations with the geriatric team, assisted by the district nurse and the home help. It was essential to bring together all the different social and medical agencies interested in the welfare of the old person. This could best be done at first on a voluntary basis.

Dr. VISCHER (Basle) described the post-mortem findings on 1,836 aged subjects from his hospital. Omitting cancer from his survey, he found that 99% of the cases had some degree of arteriosclerosis. This affected the aorta in 94%, the coronary arteries in 86%, and the circle of Willis in 71%. The main renal vessels were involved in fewer than half the subjects. Over a quarter showed myocardial fibrosis, and 9% died with coronary thrombosis. There was softening of the brain in 29% as a contributory factor. Emphysema grew more frequent with advancing years, but hypertrophy of the right ventricle in such cases was less marked as age increased. Gastric ulcers were more frequent than duodenal ones, but not related to age. Enlargement of the prostate, however, was commoner in older people than in those aged about 60. Pulmonary tuberculosis was not rare in the aged. The incidence of bronchopneumonia far outweighed that of any other pulmonary disease and was a frequent cause of death.

Dr. I. HARRIS (Bootle) spoke as a general practitioner. Formerly, he said, it had been quite easy to get an elderly patient into hospital. Now it was very difficult, as the gap left by removal of the relieving officer had never been filled. General practitioners had no contact with hospital management committees, and there seemed to be nobody whose duty it was to be responsible for hospital admissions. He advocated the creation of a senior geriatric medical officer at regional level. There should be more domiciliary consultations and mobile physiotherapy and mobile pathology services. The general practitioners were too busy to devote enough time to treating elderly patients and keeping them out of hospital. Pressure by relatives, need for laundry facilities, and so on tended to increase the calls for hospital admission of many aged persons who were sick.

Dr. A. FRANKLIN (Garston) contrasted the differences between urban and rural practice as regards the elderly patient. Difficulty over hospital admissions had begun in crowded town districts when the National Health Service had started. There were more idle, lonely, and unwanted old folk in the cities, while agricultural workers continued at their wonted work and play long after 65. More co-ordination of hospital services, consultants, district nurses, and welfare services was essential on the domiciliary front, and physiotherapy should be easily available. Only by early hospital treatment could the burden on the relatives of an old person be lessened.

Dr. E. L. ROBERTS (Formby) said there was a financial inducement for relatives to get aged people into hospital, and this also added to their reluctance to have them back again. More hostels were badly needed to ease the younger generation's plight of being tied to their houses. Otherwise hospital beds would be blocked by old people unable to return home.

Dr. K. B. GIBSON (Liverpool) thought that the general practitioner was now isolated from the hospitals, so that the profession was divided into two parts. Geriatrics must lead against this situation and bring doctors from hospitals out to meet the general practitioners in clinics and domiciliary visits. They should also take them into hospitals to help as clinical assistants and part-time medical officers to the great benefit of both parties. There was room for general practitioners here, since geriatric units did not recruit medical staff easily.

More Hostels Needed

At Fleetwood Road Hospital, Southport, in the afternoon, Dr. W. E. FITZ-GERALD, the medical officer of health, advocated a service for the elderly like that now existing for children. Remarking on the preponderance of women in the older section of the population, he mentioned the need for more ground-floor accommodation. Hostels were badly needed, preferably with a sick-bay provided. In Southport the district nurses spent half their time attending to old people, and admission to hospital was not easy. Hence efforts must begin in the home of the patient. After mentioning the local activities to help the aged sick, Dr. Fitz-Gerald urged the special allocation of hospital beds to meet the problem which had arisen.

Dr. P. Y. LYLE (Southport) likened the geriatric specialist to the general of an army. His headquarters were the geriatric unit; his weapons were the new methods of treatment and rehabilitation; his army was composed of general practitioners, nurses, home helps, welfare workers, and the relatives of the patient. Only by good staff work and deploying his forces to the best advantage could he successfully attack the troubles of old age.

After the welfare officer (Mr. Sinnert), a health visitor (Mrs. Brown), and a voluntary social worker (Mrs. Spilsbury) had described the work which they were doing in the town and its evident success, Dr. JEANIE F. WISHART spoke. She outlined the hospital arrangements for the local aged sick and the measures taken to select cases for admission to various units. Acute cases were taken at once to general hospitals to avoid delay in waiting for a bed. It was often difficult to get relatives to receive rehabilitated cases home again, and beds were blocked for lack of hostel accommodation suitable for frail ambulant patients.

SECTION OF NEUROLOGY

Friday, July 21

The Treatment of Parkinsonism

With Dr. S. P. MEADOWS, a vice-president, in the chair, Dr. HUGH GARLAND (Leeds) opened the session by saying that the Parkinsonian syndrome was first described by Parkinson in 1817, in the first account of paralysis agitans. This disease, a degenerative disorder, appeared most often in the presenium. Recent work had shown the importance of the genetic factor. Other causes for Parkinsonism were encephalitis lethargica, cerebral arteriosclerosis, neurosyphilis, and, occasionally, head injury, carbon-monoxide poisoning, and manganese poisoning. The syndrome had been reported as having appeared suddenly after an emotional shock. Dr. Garland outlined the many drugs used in the treatment of the syndrome, over the years, with little evidence of efficacy. He thought that "artane" was now the most popular. He considered the attitude of doctor and family to the patient to be of great importance. Deep *x*-ray therapy was useful in correcting sialorrhoea. Oculogyric crises, so troublesome in chronic Parkinsonism, appear sometimes to be influenced by environment, and Dr. Garland had obtained temporary good results by electric convulsion therapy.

Dr. G. E. SMYTH (Manchester) said that palliative drug treatment did not have a prolonged effect. He considered physiotherapy of the greatest importance in treatment, drug treatment coming second. He had found artane produced troublesome mental confusion in some cases.

Dr. DENIS LEIGH (London) stressed the need for objective tests and standards in assessing results of treatment. He described electromyographic and other experimental methods he had used for this purpose. He found it necessary, however, to come back to an assessment of the patient's subjective symptoms and changes. He considered artane the most effective of

the modern drugs. Dr. Leigh then spoke at length of the psychological strains and stresses of the patient with Parkinsonism in relation to his environment.

Doubts about Surgical Treatment

Sir GEOFFREY JEFFERSON (Manchester) discussed the recent attempts to relieve the tremor of Parkinsonism by surgery. He was doubtful of its value. The desiderata for operation were as follows: (1) the disease must be predominantly or wholly unilateral; (2) not, or very slowly, progressive; (3) the chief disturbance must be tremor; (4) the tremor must be so severe as to be disabling; and (5) patients must not be over 55 years.

These conditions, said Sir Geoffrey Jefferson, removed 95% of cases. The three operations at present used were, first, division of pyramidal tract on the affected side at C_2 level; secondly, ablation of cortical area 6; and, thirdly, division of the anterior limb of the internal capsule by a transventricular approach. Sir Geoffrey Jefferson found the high published mortality rate of the operations inexplicable. There was much evidence of a considerable risk of focal epilepsy after removing area 6. The published figures showed that after division of the pyramidal tract in 25% of cases there was a complete hemiplegia still present one year later. In one series of 55 cases of cordotomy there was reported worth-while relief in 15 cases. Sir Geoffrey Jefferson quoted Klemme's figures for the operation of removal of area 6. Out of 100 cases 17 died—too high a figure in the speaker's opinion—and relief of tremor was reported in 45. Myers had reported good results with his difficult operation of division of the internal capsule. Sir Geoffrey Jefferson deprecated the inaccurate publicity recently given to the treatment of Parkinsonism by surgery; he emphasized that there could be no surgical "cure" for this disease.

Sir HENRY COHEN (Liverpool) was surprised at the statements that sustained drug treatment was of no value in Parkinsonism. He had many patients benefiting from large doses of stramonium regularly administered. He emphasized the activity of the infection in many chronic post-encephalitic cases and felt that future antibiotic treatment might bring an advance.

SECTION OF OTO-RHINO-LARYNGOLOGY

Friday, July 21

Deafness in Children

With the president, Mr. I. SIMSON HALL (Edinburgh), in the chair, Mr. R. R. SIMPSON (Hull) opened the discussion on deafness in children. He said he proposed to deal only with deafness as it occurred in school-children. This was a problem which otologists should be able to solve, though, of course, they could not eliminate hereditary congenital deaf-mutism nor prevent the onset of otosclerosis in the older school-child. There remained the large problem of deafness in children due to Eustachian tube obstruction and to chronic otitis media.

It was not always easy for parents to realize that a child was deaf, and it was often the school-teacher who first suggested that the child's hearing should be examined. In this connexion the speaker regretted the change of status and importance under the new Health Service of the school clinic, for in his opinion a follow-up of suspected cases of deafness could not now be so effectively done as it was under the former school medical service. Before the war he and Dr. Ritchie Rodger, working in the school clinics in Hull, believed that they had largely eliminated chronic otitis media among the school population. The method adopted in Hull was worth recording. All the school-children in the city were inspected by the school doctors, and if any ear disorder was discovered the child was referred to one of four well-equipped clinics for examination by an ear specialist. After this examination treatment was ordered or operation advised. The "follow-up" system was excellent, and no case was allowed to become chronic. Otorrhoea was quickly spotted in the schools and the child referred to one of the ear clinics. The condition quickly cleared up under treatment or after a mastoid operation. In this way the child's hearing was saved. After this scheme had worked for a year the number of cases of chronic otorrhoea among school-children was reduced by 66%.

Mr. Simpson said there were three causes of deafness due to Eustachian tube obstruction in children—adenoids, sinusitis, and nasal allergy. Here again the school medical service did invaluable service in the early recognition of these cases. In his opinion adenoids had not been satisfactorily removed in a case of deafness unless the fossa of Rosenmüller was palpated by the gloved finger. In deafness due to sinusitis he adopted a conservative outlook. Mr. Simpson said he was surprised at the relatively few children who were certifiable as "partially deaf." He had fitted such children with a Medresco hearing-aid, and they remained at an ordinary school. The children under 14 used their aids only in school, but those over 14 were allowed to have their aids at home; this was to try to ensure that reasonable care was taken of the aids.

Value of Hearing-aids

Mr. J. H. OTTY (Bradford) gave details of his experience in the fitting of children of school age with the Medresco hearing-aid. Some 50 children had been fitted with the aids. Their ages ranged from 5 to 14 years of age. There was universal agreement among parents and teachers about the very real benefit that followed from the use of an aid. All the children showed pleasure in using it. There was a brightening of the expression in many of the partially deaf, who heard without strain for the first time. Again, there was almost universal improvement in the individual voice production. The teachers' impressions were that the children were more ready to take an active part in class lessons, and their attention was more easily sustained for longer periods. It was important that the partially deaf children should be sought out early so that they might be fitted with aids. In many cases, by so doing, they should be able to continue in normal schools. Practically all cases were fitted with individually moulded inserts for the receivers, and there had been little difficulty with their retention. The children readily learnt to adjust the volume control of the instrument and were very sensitive to defects in the instrument or batteries.

Dr. T. S. LITTLER (London) said that the steps to be taken to ensure the maximum articulation efficiency in the use of a hearing-aid would be as follows: (1) The output of the hearing-aid should be arranged so that it was never likely to exceed the maximum comfortable intensity under the conditions of use. (2) The listening positions should be arranged so that there was a minimum amount of reverberant sound and noise—i.e., by the closest proximity to the teacher and by the disposition of acoustic absorbents to reduce the effect of multi-reflective sound paths. The floors of rooms should in addition be covered by soft surfaces to reduce shuffling and impact noises. (3) The acoustic amplification of the hearing-aids should be as free from peaky responses as possible, otherwise the tolerance range was likely to be seriously affected in cases of severe nerve deafness, and the range of steady speech was likely to exceed the normal 30 decibels.

It was most desirable that a child should have a course of instruction in the manipulation of the hearing-aid, so as to use it with the maximum efficiency. Since the alleviation of deafness by the use of a hearing-aid could never restore articulation to normal it was extremely important that the child should receive a good training in lip-reading; many speech sounds which were difficult to distinguish by hearing were among those which were easy to recognize by lip-reading. So far as the constructional side was concerned, the single unit, or monopack, hearing-aid was probably the most satisfactory for children. The disadvantages of extra running costs due to battery consumption were more than outweighed by the simplicity, extra comfort, and minimization of lead breakages. Wherever possible a moulded insert should be provided, and there should be periodical checks with the supply of a new insert whenever there was any indication of an acoustic leak, with the accompaniment of inferior response or likelihood of howling. It would appear that as the use of hearing-aids in normal schools became more widespread the importance of binaural listening, refinement of response, and other improvements would receive more attention. There should therefore

be a possibility that ultimately any intelligent partially deaf child should be able to take his place alongside his hearing fellows.

Importance of Early Ascertainment

In the ensuing discussion Mr. T. E. CAWTHORNE (London) said it had been noted that some 6% of school-children were hard of hearing in one or both ears, and it was probable that about ½% were permanently hard of hearing in both ears. It was of the utmost importance that any impairment of hearing should be discovered at the earliest possible moment—often no easy matter—so that appropriate remedial or educational measures could be quickly instituted. It was always sad to see a child whose mental development, education, and speech had all been retarded because of unsuspected deafness. It was gratifying to know that the Medresco aid had proved so helpful in children. Sometimes in very deaf children the use of an aid, though it might not help in comprehending speech, resulted in an improvement in the speaking voice. In this connexion it was of fundamental importance to ensure that a deaf child always understood the meaning of any word it was asked to try to repeat. Mr. J. E. G. MCGIBBON (Liverpool) said he had found deep *x* rays of some value in the prevention of recurrent attacks of otitis. He preferred *x* rays to radium from experience in the R.A.F. Mr. R. F. J. MARTIN (Liverpool) stressed the importance of Eustachian obstruction by adenoids as a major cause of deafness in children. The operative removal must be adequate, particularly from the fossae of Rosenmüller. No mention had been made of secretory deafness. He aspirated the viscous fluid from the tympanum in such cases by means of a short-bevel lumbar-puncture needle mounted on a special type of haemorrhoid syringe.

Mr. T. A. CLARKE (Canterbury) was disappointed to learn from Mr. Otty how small a percentage of children in deaf schools were fitted successfully with hearing-aids. In his experience a much larger percentage were helped. He was disappointed also to hear the opinion expressed that mental defect was common in addition to the hearing defect; this was contrary to the teaching long given by otologists. He thought that the necessarily slow tempo of education in special schools accounted for the difficulty in transferring such children, helped by hearing-aids, to ordinary schools. The Ministry of Health should make clear to the public that the supply of hearing-aids was inadequate, and that educational and employment requirements must be met first. The Association could do a very great service to the deaf—children and adults—by encouraging the training and employment of more lip-reading instructors. Colonel J. P. J. JENKINS (Pontypool) said that as a general practitioner he had found that the mothers would not bring their children regularly for treatment. They were not prepared to wait for hours in overcrowded surgeries for treatment lasting only a few minutes. Therefore facilities should be provided for treatment in centres equipped with a trained staff. Mr. G. A. MOULDEN (Birkenhead) was surprised at the omission to mention catarrhal otitis media with effusion as a cause of deafness in children. Hoople had recently made a plea for better teaching about this condition, stressing the difficulty of diagnosis by inspection alone. He (Mr. Moulden) would like to stress the value of tympanic aspiration; if the condition was left untreated or did not resolve spontaneously deafness developed.

Mr. J. C. MCFARLAND (Liverpool) had had disappointing results from irradiation. He found that otologists were asked to make very few domiciliary visits: it was surely important that cases of acute otitis media should be seen early, so that myringotomy should, if necessary, be done before chemotherapy was begun. Mr. I. SIMSON HALL asked if it was possible to decide by an audiogram whether a child should go to a special or an ordinary school. In Edinburgh every possible acute case was admitted to hospital. At least 91% were cured by conservative treatment inside 12 weeks, and of the residue 89% were then cured by simple operative measures.

Mr. SIMPSON, in reply, said that the answer to Colonel Jenkins's problem was efficient school treatment centres, and he thought the Ministry should re-establish them. In his estimate 1% of children referred for deafness in Hull were partially, and 0.1% totally, deaf. He agreed that for the partially deaf training in the use of an aid and return to a normal school produced much better speech in the child. He agreed with Mr. Clarke's figure of 25% fitted with aids, and said that even toddlers had been successfully fitted. Mr. OTTY, in reply, said he wished to stress the importance of lip-reading instruction. He thought that the old school medical service should be re-established by the hospitals. He had found the incidence of recurrent otitis to be reduced by irradiation. Dr. LITTLER, in reply, said that a hearing-aid should be fitted at as early an age as possible, provided no distress was caused. This could best be assured by keeping output at a low level. Two devices were being experimented with, known as "peak limiting" and "automatic volume control." These aimed at restricting speech reception to the tolerance range. The child should sit as near the teacher as possible, but screening devices should be avoided, as they tended to put the child in a special "compartment."

Correspondence

Infection by Syringes

SIR,—I was very glad to see the paper by Drs. R. J. Evans and E. T. C. Spooner (July 22, p. 185), pointing out the danger inherent in one of the common methods of mass inoculation. In your annotation on the subject (p. 204) you suggest two possible improvements, neither of which seems very good.

May I bring to your notice another method which is simple and effective? This is not a new method, for it has been used for half a century. Instead of changing the syringe and/or the needle for each inoculation, the same syringe and the same needle can be used throughout the series of inoculations. The syringe is sterilized immediately before each inoculation by four or five successive fillings and emptyings with liquid paraffin at 130° C. If a fine needle is being used through which the oil will not rapidly pass it is better to remove the needle and then sterilize the barrel of the syringe with the hot oil. The needle is then replaced and can be held in the hot oil for 15 to 30 seconds, or the hot oil can be drawn through and expelled several times.

If great speed of inoculation is desired two syringes can be used, and an assistant sterilizes one while the other is being used. Another advantage of this method is that the needles are always oily, so that they do not rust and remain sharp for a long time.

As I have said, the method is not new. It was devised by Sir Almroth Wright in the early days of this century and was used by him and his pupils (of whom I have the honour to be one) ever since as the standard method employed in the Inoculation Department of St. Mary's Hospital. In that one institution close on one million inoculations have been given with syringes sterilized by hot oil, and there have been no disasters. The method is described in Wright's book[1] on the technique of the teat and capillary glass tube, and more recently the merits of the method have been pointed out by K. B. Rogers.[2]

I have myself used this method of sterilizing syringes for inoculation since I entered Wright's laboratory in 1906, and I still use it. I cannot remember in that 44 years septic complications in any of the thousands of patients I have inoculated.

If it is desired to use a syringe containing many doses of the vaccine or toxoid I would suggest that this can still, with the aid of a hot-oil bath, be done safely and simply. Instead of removing the needle and thereby infecting the syringe, the needle is merely dipped into hot oil for about 10 seconds. The oil could for this purpose be at a higher temperature than could safely be used to sterilize Record syringes, and temperatures of 150° or 160° C. could be employed. The water in the needle would boil, and any pathogenic organism likely to have infected

the needle would be destroyed. At the same time the needle is oily, so that it goes through the skin more easily and remains sharp for a long time.—I am, etc.,

London, W.1. ALEXANDER FLEMING.

REFERENCES

[1] Wright, Sir A. E., and Colebrook, L., *Technique of the Teat and Capillary Glass Tube*, 1921, London.
[2] *Lancet*, 1946, **2**, 87.

SIR,—I have read with great interest the article on this subject by Drs. R. J. Evans and E. T. C. Spooner (July 22, p. 185). By a curious coincidence I have recently referred to the same problem in an article in the *Medical Officer* (July 15, p. 29), the point there being prevention of the possible transference of the virus of poliomyelitis from one individual to another. Without then having the benefit of the experiences described by the above workers, I suggested the following: (1) Only the amount of material required for one injection should be drawn up into the syringe. (2) Obviously a sterile needle is used for each case. (3) After discharging the contents, the plunger should be kept pressed firmly home until the needle is withdrawn from the arm.

I was not apparently far wrong, with the exception of the possibility of fluid being sucked up the bore of the needle in the act of removal from the syringe, owing to the vacuum created when disconnecting the boss.

Here, then, is a further suggestion. Slightly more fluid is drawn up into the syringe than is required for the injection. The correct amount having been inoculated (when convenient subcutaneously, to avoid built-up pressure from muscular contraction) the syringe and needle are withdrawn and the remainder of the fluid is expelled through the needle before removal of the latter from the syringe for changing. I think that the syringe should have a plunger which fits perfectly, like the good old "agla" once supplied by Burroughs Wellcome and Co., and it should be slightly stiff in operation. Further, pressure of the thumb or palm of the hand should be maintained evenly on the plunger during removal of the needle from the arm. Most of the pitfalls should be covered by this procedure.

Short of sterilizing numerous syringes, which is difficult in mass immunization, this is the most watertight technique that I can envisage. I would be glad to hear what Drs. Evans and Spooner think of this as the best compromise.—I am, etc.,

London, S.E.5. GUY BOUSFIELD.

SIR,—I have read with considerable interest the paper by Drs. R. J. Evans and E. T. C. Spooner on this subject (July 22, p. 185), and noted that, though using a bacteriological method, they confirmed my findings which were published in the *British Medical Journal* in 1946.[1]

I continued my investigations and published the results in the *Journal of the Royal Army Medical Corps* in 1946.[2] This further work made it clear that the pumping action on removing a needle from a syringe was of considerable importance, particularly with the large "Army" fitting. I found that with a Record fitting contamination with red cells occurred in 14% of instances after an intramuscular injection, whereas with an "Army" fitting it occurred in 47% of instances. As Evans and Spooner, using a very sensitive bacteriological method, have found contamination of the syringe in 81% of injections with a Record fitting, presumably if the experiments were repeated using their method contamination with an "Army" fitting would be almost 100%.

Syringe contamination would certainly seem to be an important factor in the transmission of infective hepatitis and possibly other diseases during mass inoculation in the Forces. It would be a pity to discard the "Army" fitting on this account alone, as the larger joint is much more convenient than the Record fitting—the needle does not tend to slip from the syringe, and one can use a large aspirating needle on the syringe with a good deal more security. In my opinion the "Army" fitting would be mechanically more satisfactory than the Record fitting for general use.

I suggested a simple method by which contamination of the syringe could be avoided during an intramuscular injection. In brief, this consists in interposing a removable tap between the needle and the syringe; when the injection is given the tap is turned off, the needle withdrawn from the tissues, and the tap and the needle removed for sterilizing. A further tap and needle can then be applied to the syringe for the next injection. This method has the great advantage that the needle and tap can be rinsed and dropped in a boiling sterilizer, to be sterilized in the minimum of time, unlike syringes, which are liable to breakage by unskilled personnel. I carried out a series of 99 intramuscular injections using this technique, and on microscopical examination for red cells I was unable to detect contamination of the syringe in a single instance. It would be interesting if this work could be repeated using Evans and Spooner's bacteriological technique; if the safety of the method is confirmed I think it might well be adopted during mass inoculations. The taps could be mass produced at a comparatively small cost: only about half a dozen would be required for each operator.

Incidentally, the author of your annotation on syringe sterility in the same issue of the *Journal* (p. 204) scarcely does me justice when he states:

"Hughes concluded that the pressure produced, especially by a rapid injection into contracted muscle, may force a little fluid back into the nozzle of the syringe. No suggestion is offered in his paper that any other mechanism may be concerned."

I would draw his attention to the final paragraph of my paper, published in the *Journal* in 1946, which is as follows:

"The limited number of investigations carried out suggests that contamination occurs as follows. A small amount of fluid is forced back into the needle after the injection, or traces of blood are left on the tip of the needle when it is withdrawn; this blood tends to spread slowly along the needle, and on removing the latter from the syringe the needle contents are aspirated, leaving a contaminated drop of fluid on the tip of the syringe. This drop contaminates the next injection, despite the changing of the needle."

If he still doubts whether I mentioned the importance of aspiration of fluid from the needle when it is removed from the syringe, I would refer him to my paper in the *Journal of the Royal Army Medical Corps*.[2]—I am, etc.,

Liverpool. ROBERT HUGHES.

REFERENCES

[1] *British Medical Journal*, 1946, **2**, 685.
[2] *J. R. Army med. Cps*, 1946, **87**, 156.

Haemorrhage from Peptic Ulcer

SIR,—The discrepancy between mortality figures in haematemesis and melaena given in the *Journal* of July 15 by Drs. C. D. Needham and J. A. McConachie (p. 133) from the Aberdeen Royal Infirmary and by Drs. A. G. Ogilvie and I. O. B. Spencer (p. 138) from the Royal Victoria Infirmary, Newcastle-upon-Tyne, is so great that a further comment on them may not be out of place. There will probably be general agreement with the statement of Needham and McConachie that their mortality rate of 13.9% for 476 cases corresponds to results obtained for a similar period in most general hospitals. The achievement of Avery Jones[1] (7.8% mortality in 615 cases) shows clearly how large is the room for improvement, but I submit that the very low mortality claim by Ogilvie and Spencer (2.4% in 170 cases) may be misleading.

To begin with, the total number with which these authors deal is relatively small—they work out at two patients per month, while general physicians in hospitals of comparable size where no restriction is placed on admission of such cases will often handle many times that number. This low turn-over suggests that only a small proportion of cases of haematemesis and melaena occurring in the populous area of Newcastle-upon-Tyne found their way into the Royal Victoria Infirmary, probably because of needs for teaching students. The figures given by Ogilvie and Spencer bear out the idea that such a selection was indeed made, because they show that only 16% of their patients were over 60 years of age, most of these between 60 and 70, whereas the records of Needham and McConachie, Avery Jones[1] from the Central Middlesex Hospital, and Baker[2] from the Selly Oak Hospital, Birmingham, dealt with about 30% of patients over 60, a heavy proportion of whom were over 70.

Without knowing what happened to the other patients with bleeding peptic ulcers in Newcastle-upon-Tyne, it is difficult to accept Ogilvie and Spencer's mortality figures at their face value.

On the larger issue, haemorrhage from peptic ulcers ceased some time ago to be solely the preoccupation of physicians, and now even the most conservative recognize that surgery has a place in the treatment of that emergency. Few will be found to subscribe to the idea that all, or even the majority of, cases of such haemorrhage should be operated on as a matter of course, and the balance of present-day opinion inclines to the view that there is a definite, though not very large, percentage of cases in whom operation would be a life-saving measure.

Most clinicians now feel that an emergency operation should be offered to some of the patients in whom severe haemorrhage recurs after admission to hospital. Obviously a number of such patients will not be fit for operation for a variety of reasons, while others may refuse surgical aid, and the crux of the matter is to balance in the remainder the probability of death without and with operation. The problem would be easy if only there were a way of divining whether bleeding comes from an opening in a sizeable artery, often eroded tangentially in the floor of a chronic ulcer, because it is then that an imminent threat to life exists. Few will disagree that in such instances an operation, preferably a partial gastrectomy, should be performed.

In the various series of cases of haematemesis and melaena recorded I have yet to find a reference to the type of patient who is admitted—sometimes shocked, sometimes in a fair condition—who in spite of recognized treatment continues to lose ground in a rather insidious way. The blood count of such patients goes on dropping to a level far below that for which haemodilution would account; frequently they do not vomit or pass melaena stools, and one must assume that in them continued seepage of blood into the bowel is taking place. I am sure others will recognize in that description a large group of cases whose place is between those who go all one way and give rise to little anxiety and, at the other extreme, those in whom a sharp recurrent haemorrhage gives clear warning of impending disaster. The patients in this middle group often benefit from blood transfusion, and with experienced management they will rarely need an operation.

This letter is not the place for giving an account of the routine treatment of haemorrhage from peptic ulcers adopted in the hospital at which I work—this has been done already by Baker in his report—but one of the points I insist on in my patients is the avoidance of any aperients or enemata in the first week after admission, or even longer if melaena continues. I have found from prolonged observation that, as in typhoid, constipated patients with haematemesis or melaena rarely die. I feel that injudicious stimulation of the bowel in a precariously balanced patient may start bleeding again. It is true that an occasional subject has to pay for my view with faecal impaction, but, while this may give rise to considerable discomfort, it can be relatively easily relieved and does not endanger life.

Finally, those charged with the care of patients suffering from haematemesis and melaena will agree with the views expressed in your leading article (p. 153) that there is a real need for further clinical studies of this serious and all too commonplace problem.—I am, etc.,

Birmingham. A. M. NUSSEY.

REFERENCES

1 *Guy's Hosp. Rep.*, 1947, **96**, 1.
2 *British Medical Journal*, 1947, **2**, 441, 477.

Abortion

SIR,—We should like to offer the following comments on the review of 2,665 cases of abortion by Mr. Albert Davis (July 15, p. 123). He suggests that the frequent finding of organisms such as *Staphylococcus albus* and diphtheroids is indicative of active infection.

In the former London County Council puerperal sepsis unit at the North-western Hospital, Hampstead, a strict bacteriological survey of all cases of post-abortal sepsis was carried out between 1937 and 1946, and the infecting organisms were classified as follows:

Infecting organism	Cases	Percentage
Haemolytic streptococcus	134*	13.9
Staphylococcus pyogenes	110	11.4
Bact. coli	239	24.8
Other aerobes	119	12.3
Cl. welchii	190	19.7
Anaerobic streptococci / *Bact. pseudonecrophorum*	125	12.9
Negative cultures	48	5
Total cases	965	100

* 60 strains (45%) belonged to group A.

While a series of 50 consecutive cases of abortion are not strictly comparable with cases of definite sepsis, nevertheless we did not consider that the presence of organisms such as *Bact. coli, Cl. welchii*, anaerobic streptococci, or coagulase-negative staphylococci was always associated with clinical signs of infection, although putrefying products of conception may certainly encourage their proliferation.

The greatest difficulty in the bacteriological assessment of these cases is the determination of the pathogenicity and invasiveness of the various organisms found on cervical culture. The wide variation in the toxigenicity of *Cl. welchii* strains has been emphasized in a previous study.[1] Experience has shown also that the finding of coagulase-positive staphylococci on cervical culture carries with it a considerable chance of pyaemia, whereas coagulase-negative organisms can be disregarded.—We are, etc.,

A. MELVIN RAMSAY.
J. VAHRMAN.

London, N.W.3.

REFERENCE

1 Ramsay, A. M., *J. Obstet. Gynaec. Brit. Emp.*, 1949, **56**, 247.

SIR,—In his interesting report on abortion Mr. Albert Davis (July 15, p. 123) describes a method of causing the uterus to empty itself while the cervical canal is distended by a Hegar's dilator. Ten units of oxytocin are injected into the uterus. Since I have seen severe and prolonged circulatory collapse following the administration of ten or even five units of "pitocin," I am prompted to ask if the risk of this alarming complication is justified in order to achieve a more or less bloodless evacuation of the uterus.—I am, etc.,

Birmingham. HUGH C. MCLAREN.

D-tubocurarine Salts and Derivatives

SIR,—The letter from Drs. G. A. Mogey and J. W. Trevan (July 22, p. 216) rightly calls attention to the need for exercising caution in using derivatives of D-tubocurarine. The variation in the relative potencies of D-tubocurarine and its dimethyl ether from species to species is, as the writers point out, not surprising, nor indeed are the variations observed with different methods of testing and modes of administration; for it would be very unusual if a phenol and its methyl ether were absorbed and metabolized in precisely the same way.

The experiments carried out by Dr. H. O. J. Collier and Mr. R. A. Hall (June 3, p. 1293) were designed to show whether dimethyl tubocurarine differed in any important respect from D-tubocurarine. The results obtained with different species of animals were important because they indicated that the relative potencies of the two substances varied from species to species, suggesting that there might also be a difference in the relative potencies of the two substances in humans. Such a difference was in fact found, and was favourable to dimethyl tubocurarine, which, according to Drs. H. B. Wilson, H. E. Gordon, and A. W. Raffan (June 3, p. 1296) and Pelikan, Sadove, and Unna,[1] is two to two and a half times as potent as D-tubocurarine in humans. The pharmacological investigation showed furthermore that for equipotent doses in the cat less histamine was released by dimethyl tubocurarine than by D-tubocurarine and that there was less paralysis of the autonomic ganglia. Further, in the rabbit and the rat there was less paralysis of respiration by dimethyl tubocurarine than by

equipotent doses of D-tubocurarine. Far from being a more dangerous drug than D-tubocurarine, dimethyl tubocurarine clearly has several desirable properties not shared by D-tubocurarine.

The conclusion to be drawn from the results quoted by Drs. Mogey and Trevan is presumably that, whatever the methods used by research workers in evaluating a new drug, the potency and toxicity of any particular sample of that drug must be determined relative to that of a standard specimen of the substance, ideally a chemically pure specimen. This is of course the procedure followed with D-tubocurarine, every batch of which must be approved by the Ministry of Health following a direct comparison with a standard preparation of D-tubocurarine chloride kept in the National Institute for Medical Research. The reason is that D-tubocurarine is a "therapeutic substance the purity or potency of which cannot be adequately tested by chemical means" and thus falls within the scope of the Therapeutic Substances Act, 1925, to which it was made subject by the Therapeutic Substances (Amendment) Regulations, 1948. Drs. Mogey and Trevan have indicated how difficult it is to prepare a chemically pure specimen of such a complex substance as D-tubocurarine, which may exist in a large number of different enantiomorphic forms. These considerations apply equally to dimethyl tubocurarine, although in preparing it from tubocurarine by methylation the number of enantiomorphs present would tend to be reduced and would certainly not be increased. In any event, no reputable manufacturer would attempt to prepare dimethyl tubocurarine iodide for clinical use by methylation of crude mother liquors.

Drs. Mogey and Trevan draw attention to the variations obtained by different workers in values for the ratio:

$$\frac{\text{potency of dimethyl tubocurarine salt}}{\text{potency of D-tubocurarine salt}}$$

Reference to Table I in the paper of Collier and Hall indicates that only two seriously aberrant values are found among the total of 19. One of these, the value of 5 in man, was obtained by Marsh, Sleeth, and Tucker[3] in a single volunteer, and it would be reasonable to discount it. The other, a figure of 8, obtained in the rat by Marsh and his colleagues, would appear to be anomalous. The rat appears to be the only animal in which such an anomaly has occurred. It so happens that in these laboratories the rat has been regularly used for assaying the potency of dimethyl tubocurarine since 1948. Results with consecutive samples have been very uniform in this animal, and nothing resembling the results of Marsh and his colleagues has come to light.

The fears expressed by Drs. Mogey and Trevan that different batches of dimethyl tubocurarine iodide may vary widely in potency and toxicity should be dispelled by the information that dimethyl tubocurarine iodide, like D-tubocurarine chloride, now falls within the scope of the Therapeutic Substances Act, 1925. The provisions applicable to this substance are contained in part III of the ninth schedule in the Regulations of 1948, and the licensing authority has tested and approved all the material recently made available to clinicians. Moreover, the potency of recent batches has been compared with that of a standard preparation of the dimethyl ether kept at the National Institute for Medical Research, so that the misgivings expressed by your correspondents have been anticipated and no clinician need feel that he is running unnecessary risk in using dimethyl tubocurarine in preference to D-tubocurarine.—I am, etc.,

Ware, Herts. NORMAN EVERS,
Director of Research, Allen and Hanburys, Ltd.

REFERENCES
1 *J. Pharmacol.*, 1950, **98**, 25.
2 Ibid., 1948, **93**, 109.

Vascular Changes in Diabetes

SIR,—Dr. Elliott P. Joslin (May 13, p. 1095) demonstrates the formidable incidence of peripheral vascular disease in young diabetics, and Dr. Cecilia Shiskin (June 24, p. 1490) and Dr. R. D. Lawrence (July 8, p. 107) consider the possibility (I like to think probability) of a common factor causing both diabetes and vascular damage; this awaits further research, but there is another aspect on which I should like to invite opinion. Vascular disease is believed to be a degenerative process which affects diabetics and non-diabetics; in the former there is a heavier incidence and earlier onset. May this be due to malnutrition of the peripheral tissues, including the vascular system? Perhaps this factor makes gangrene of the toes so much more common in diabetics than in non-diabetics with arteriosclerosis. The diabetes is usually mild and stable in these cases, the blood sugar being easily kept within orthodox limits with small doses of insulin, yet gangrene, superficial or deep, develops in one toe after another. Dr. Lawrence points out that no diabetic has a normal sugar metabolism. Certainly the injection of insulin, which is absorbed into the blood stream regardless of the prevailing glucose level, is a clumsy substitute for the delicate mechanism by which it is secreted normally in response to a rise in the blood sugar. It seems possible that injected insulin needs a greater "head" of sugar in the blood than that found in the normal person in order to carry out the anabolic process of promoting the storage and utilization of glucose.

The fear that a persistent high blood sugar is harmful has overshadowed our thought and practice; I suggest that it is not the high blood sugar *per se* which brings disaster to the untreated diabetic, but rather starvation in its widest sense. Two observations illustrate my point. First the dramatic improvement in the general health, strength, and weight of a diabetic as soon as he begins insulin and long before the blood sugar levels become normal; and secondly an observation on the nutrition of the muscles. The diabetic before he begins insulin experiences an aching and weakness of the great muscles of the thighs—e.g., on going upstairs. The diabetic on insulin develops exactly the same weakness and aching if, for example, in the course of a long walk hypoglycaemia develops. In both cases the sugar metabolism is at fault and the muscles are deprived of fuel.

Dr. Joslin's observation that on the whole the better controlled patients resist longer the onset of vascular complications is not incompatible with this suggestion, since the badly controlled probably have insufficient insulin for their metabolic needs; but the fortunate few, who escape vascular complications after more than 20 years, are by no means those who adhere to a strict regime, weighing their food and testing their urine, but often lead a full free life, taking exercise, food, anxiety, and hard work as it comes.

The practical application is to endorse and underline the doctrine that a persistently low blood sugar is more dangerous to diabetics than a persistently high one. Should we set the optimum in routine blood sugar estimations, four hours after meals, at a higher level than that of a normal person—perhaps at above the renal threshold of 180 mg. per 100 ml. ?—I am, etc.,

Hove, 3. G. M. WAUCHOPE.

Rectal Thiopentone in Children

SIR,—On reading Dr. John Lorber's article on this subject (July 1, p. 21), I was struck by his omission to lay sufficient stress on the potential hazards of this method. The technique described is so simple that physicians using it for diagnostic procedures may be tempted to employ this method where no trained anaesthetist is available or present. Such a course should under no circumstances be contemplated, as considerable respiratory depression may ensue from the dosage the author recommends, and as there is no evidence that the drug given by the rectal route will be less liable to predispose to laryngospasm than when given intravenously.

In that connexion I also notice that Dr. Lorber fails to mention a laryngoscope and endotracheal tubes as accessories which should be available whenever thiopentone is being given by whatever route. Indeed, it appears likely that the patient who had "severe spasm of coughing and temporary cyanosis" may have suffered from a mild attack of laryngospasm, which fortunately resolved spontaneously. Atropine is by no means infallible in preventing such an occurrence, although it will markedly lessen the vagal hypersensitivity induced by thiopentone.

This and the other case of aspiration of vomitus constitute 3% of the whole series, and any one of these two cases may have had serious consequences. Thus one cannot fail to wonder whether the risk involved is not too high a price to pay in order to obtain sedation for diagnostic procedures.—I am, etc.,

University of Illinois, Chicago, U.S.A. GORDON M. WYANT.

Intermittent Dosage with Streptomycin

SIR,—I have read with interest the article "Intermittent Dosage in the Treatment of Pulmonary Tuberculosis with Streptomycin" (May 27, p. 1224) and also the leading article entitled "Streptomycin Resistance of Tubercle Bacilli" (p. 1245).

Reports of this kind ably presented by the Medical Research Council are eagerly awaited and usually put into effect in this country. In view of this I would like to draw attention to a principal finding in the above article—"It is concluded that one gramme of streptomycin a day in a single injection, without intermission of treatment, is the most satisfactory way of giving the drug in pulmonary tuberculosis." The continued existence of a streptomycin-resistant organism depends on possibly two factors—an inherent and an acquired or environmental factor, which latter is dependent on a low peak concentration of streptomycin. The four dosage groups employed in this case in an attempt to avoid or delay the emergence of predominantly streptomycin-resistant tubercle bacilli in the treatment of the disease have been all of relatively bacteriostatic, not bactericidal, regimes. The use of a higher single dosage of streptomycin given twice weekly and its bactericidal effect on the life cycles of the tubercle bacilli and their mutants have not, in this case, been considered.

The coexistent use with streptomycin of a synergistic drug such as P.A.S. to prevent the formation of streptomycin-resistant mutants is plausible, but it seems that a fundamental factor is being ignored when the dosage of streptomycin given does not prevent, indeed is conducive to, the formation of a streptomycin-resistant from a previously streptomycin-sensitive tuberculous organism, irrespective of its inherent property.—I am, etc.,

Adelaide, South Australia. R. MUNRO FORD.

Domiciliary Treatment of Tuberculosis

SIR,—Under the subheading "Doctors' Ignorance," in the account of the meeting of the Sections of Diseases of the Chest and Tuberculosis and of Preventive Medicine at the Annual Meeting of the B.M.A. in Liverpool, Dr. W. D. Gray is reported in the *Liverpool Echo* (July 20) as having expressed the following opinion: "There is a deplorable ignorance among general practitioners about the first principles of treatment in tuberculosis."

We feel that Dr. Gray should seek the hospitality of your columns to substantiate or withdraw this serious charge, which, to our knowledge, has already caused considerable concern among patients.—We are, etc.,

R. FITZGERALD,
M. J. O'DONNELL,
T. A. G. HUDSON,
C. A. L. KELLY,
T. J. COAKLEY,
P. T. GARRY,
T. A. JERMY,
JAMES BINNIE,
E. V. O'RIORDAN,
J. V. COGHLAN.

*** A letter from Dr. W. D. Gray is published below.—ED., *B.M.J.*

SIR,—In my address to the Sections of Diseases of the Chest and Tuberculosis and of Preventive Medicine at the Annual Meeting of the B.M.A. in Liverpool I complained of the ignorance about principles of treatment of tuberculosis shown by some general practitioners. This I attributed to faulty education in our medical schools, where many students are trained without ever entering a sanatorium or chest clinic for instruction. My charge was that some general practitioners do not seem to realize that it is more important for the tuberculous case to rest in bed while awaiting admission to sanatorium than it is for him to seek fresh air by walking in the park. I complained that some doctors told the patients to go out, when I had told them to stay in bed. I also referred to some general practitioners prescribing streptomycin and P.A.S. indiscriminately, without consulting the tuberculosis officer or chest physician. This was also mentioned by Professor F. R. G. Heaf.

The press excerpt from my address did not report that I said: "There are many general practitioners with whom it is a pleasure to work, however, and they make the care of the tuberculous at home much easier for the clinic physician. Close co-operation is essential for success." I fully realize the difficulties of the busy general practitioner in any industrial city, and my aim in mentioning these points was solely to stress the need of closer co-operation between specialist and general practitioner in the home treatment of the tuberculous.—I am, etc.,

Liverpool. WILLIAM D. GRAY.

Stevens-Johnson Syndrome

SIR,—In view of the recent paper by Dr. Bernard A. Thomas on this subject (June 17, p. 1393), the following case may be of interest.

A married woman aged 31 years came to the surgery on May 20 complaining of the sixth attack of a condition which appeared as blistering of the lower lip and hands and intense itching of the eyes and vulva. She stated that she had been exceptionally healthy until February, 1949, when she had her first attack, which was sudden in onset. The attacks invariably started with an eruption on her lip, which symptom was the last to disappear after the attack had subsided. The blisters on her hands appeared two or three days after the lip eruption. This was the first time in which the eyes or genitals were affected.

Her temperature was normal. There was slight injection of the conjunctiva, one fairly large bulla on the lower lip, and several smaller blisters on the inside of the lower lip. The dorsum of the hands was covered with small clear blisters. The palms and palmar aspect of the fingers were covered with closely set erythema iris macules, which did not subsequently progress to bulla formation. There were a few scattered macules on either forearm which did not form bullae. Desquamation took place in from 10 to 14 days. The blood Wassermann reaction was negative. There was mild secondary anaemia. The urine was normal. Fluid from the blisters yielded no organisms. No history of allergy or susceptibility to sulphonamides or other drugs could be elicited.

This appears to be a mild case of erythema exudativum multiforme (Hebra). A point about it seems to be that the attacks are increasing in severity gradually, since this is the first time in which the conjunctivae were involved even mildly. The normal temperature is also unusual.—I am, etc.,

Tullow, Co. Carlow. J. B. MAHER.

R.A.M.C. Roll of Honour

SIR,—May I crave the hospitality of your columns to inform your readers that the Roll of Honour of all ranks of the R.A.M.C. who gave their lives during the Second World War (September 3, 1939–May 8, 1946) is now complete, and copies have been sent to all the next-of-kin with whom we have been able to get into touch. I shall be glad to send a copy to any who, owing to a change of address or other cause, may not have received the original notice. Application should be made to me at R.A.M.C. War Memorial Fund, 34, Victoria Street, S.W.1.

The Roll is included in an illustrated booklet describing our Book of Remembrance, the Memorial Window, and other Corps Memorials in Westminster Abbey and its precincts, and will be sent to any of your readers who are kind enough to send a donation to our fund, which is devoted to helping all ranks of the R.A.M.C. who took part in the war, and their families.—I am, etc.,

London, S.W.1. R. E. BARNSLEY, Major-General.

Obituary

IVOR I. PRICE, M.B., F.R.C.S.

Mr. I. I. Price, senior consultant surgeon to the Whittington Hospital, London, died on July 24, 1950, at the age of 46.

Ivor Isaac Price was educated at Daventry Foundation School and entered King's College Hospital Medical School in 1920. He had a most distinguished student career and won many awards, among them the Alfred Hughes Memorial Prize and the Senior Scholarship. He took the conjoint diploma in 1925 and graduated M.B., B.S. in 1926. After holding resident appointments at King's College Hospital and Queen Mary's Hospital for the East End he was appointed medical superintendent at the Seamen's Hospital, Tilbury. He became a Fellow of the Royal College of Surgeons in 1928, and in 1929 he entered the London municipal hospital service, where his outstanding surgical skill and judgment brought him rapid advancement. He served in several surgical posts in L.C.C. hospitals, and in 1938 was appointed senior resident surgeon and deputy medical superintendent at St. Mary Islington Hospital. Here he soon built up a reputation as an able general surgeon, widely respected by the general practitioners of the district and by the large numbers of patients who had reason to be grateful for his skill and kindness. His experience covered almost every field of surgery, and he published papers on several subjects in this *Journal* and elsewhere, but he developed a special interest in gastro-enterology.

In the L.C.C. hospital service he was one of the pioneers of gastroscopy, at which he became highly skilled. As an operator he was quick, yet gentle and meticulous, and he had special success with patients whom many would regard as poor operative risks. He was a scrupulously conscientious surgeon, avid for work, and was seen at his best in his handling of the patient with post-operative complications. Those who worked with him will always be grateful for the way in which he rallied to their support when problems arose, and he was especially beloved by the nursing staff. He was an accomplished clinical teacher, and many candidates for the F.R.C.S. examination will remember the bedside classes which he so ably conducted for the Fellowship of Postgraduate Medicine.

In 1947 Mr. Price was appointed surgeon specialist by the London County Council. Unhappily it was about this time that he suffered the first symptoms of heart disease, and in the following year he had two attacks of coronary thrombosis. He returned to duty early in 1949 and took up his operative work again. With the reorganization of his hospital under the National Health Service and its amalgamation with the two adjacent hospitals to form the Whittington Hospital, he became surgical director of the newly established gastro-enterological unit. Despite recurrent anginal attacks he was courageously taking an increasingly heavy share of the arduous surgical work of this unit, when he suffered his third and fatal attack of coronary thrombosis. Though his determination to return to active surgical work probably shortened his life, all who knew him will realize how characteristic was his decision to carry on to the end. He leaves a widow and one young son.—A. L. J.

Sir John Hutson died at his home in Pine Hills, Barbados, British West Indies, on March 29 at the age of 91. The son of the late Archdeacon Hutson, he was one of three brothers, each of whom held distinguished positions in the Colonial Empire. His eldest brother, Sir A. Hutson, was a Colonial Governor, while his other brother was Bishop of Antigua and Archbishop of the West Indies. John Hutson was educated at Lodge School, Codrington College, and Edinburgh University, where he graduated M.B., C.M. in 1883. He took the Cambridge D.P.H. in 1905. Returning to Barbados, he joined the staff of the General Hospital there, and he served as public health inspector and poor law inspector for a time. Subsequently he was appointed chief medical officer when that office was created. He was appointed a member of the Legislative Council in 1920, and served on the Education Board and on the Executive Committee. He represented Barbados at the coronation of King George VI, and until he resigned the presidency of the Legislative Council he was chairman of the local branch of the Empire Parliamentary Association. Sir John Hutson, who was knighted in 1943, had been a member of the British Medical Association for over sixty years, and he represented the Branch at the annual meetings at Portsmouth in 1923 and at Eastbourne in 1931. He was president of the Barbados Branch in 1929–30 and then from 1932 to 1938. He was one of the Branch's keenest and most hard-working members, and the sympathy of all his colleagues and friends will be extended to Lady Hutson, who survives him.—A. P. M.

Medico-Legal

TRESPASS AND ASSAULT

A recent report in these columns entitled "Trespass by a House-surgeon" (July 15, p. 171) has prompted the council of the Medical Defence Union to remind practitioners again of the need to obtain proper consent in writing from patients or their relatives when any operative treatment is recommended.

This case has emphasized another point. It is also essential to make it clear that, when a patient is admitted to hospital for operative treatment, the operation proposed will not necessarily be performed by any particular surgeon, who may have seen the patient previously, or under whose name he is admitted.

So that practitioners will be provided with adequate legal authority and protection to avoid the risk of their subsequent appearance in the Courts on a charge of trespass or assault, the council of the M.D.U. has had prepared a number of model forms. These forms of consent, reproduced below, are considered appropriate by the solicitors to the M.D.U.

Consent by Patient

I ..... of .....
hereby consent to undergo the operation of .....
the effect and nature of which have been explained to me.

I also consent to such further or alternative operative measures as may be found to be necessary during the course of such operation and to the administration of a local or other anaesthetic for the purpose of the same.

I understand an assurance has not been given that the operation will be performed by a particular surgeon.

Dated this ..... day of .....

(Signed)

Consent by Relatives

I ..... of .....
the ..... of the above named .....hereby also consent to such operation.

Dated this ..... day of .....

(Signed)

(The formula of consent by the spouse or near relative, although not strictly necessary in law, may save trouble afterwards.)

Consent for Minor

I ..... of .....
hereby consent to the submission of my child .....
to the operation of ..... the effect and nature of which have been explained to me.

I also consent to such further or alternative operative measures as may be found to be necessary during the course of such operation and to the administration of a local or other anaesthetic for the purpose of the same.

I understand that an assurance has not been given that the operation will be performed by a particular surgeon.

Dated this ..... day of .....

(Signed)

Consent for E.C.T.

I ..... of .....
hereby consent to the administration of convulsive therapy, the effect and nature of which have been explained to me. Notwithstanding the fact that there are certain risks of injury inherent in the treatment, I request you to administer the same to me and I accept any risk attaching to such administration.

I understand that an assurance has not been given that the treatment will be administered by a particular practitioner.

Dated this ..... day of .....

(Signed)

Medical Notes in Parliament

ROYAL ASSENT TO THE MEDICAL BILL

The Medical Bill became an Act of Parliament on July 28. The amendments made in its passage through the House of Commons were agreed to by the House of Lords on July 26, and on the 28th, the day Parliament rose for the summer recess, the Royal Assent was signified to it and a number of other Acts by commission.

Tuberculosis in Scotland

Mrs. JEAN MANN asked the Secretary of State for Scotland on July 25 what consideration he had given to the report of the Scottish Committee on Tuberculosis Service in Scotland; and if he would make a statement on the recommendation of crisis expansion of tuberculosis service.

Miss HERBISON, the Under-Secretary, replied that with his officers the Secretary of State had been studying carefully this report, but had found in it no recommendation for the expansion of facilities which had not already been considered, while most of the recommendations had been tried with varying degrees of success. In the last two years more than 300 additional beds had been brought into use for respiratory tuberculosis, many of them in infectious-diseases and general hospitals. This process he proposed to continue, especially in general hospitals where nursing staffs were strongest.

Mrs. MANN said that not all the recommendations published in the *British Medical Journal* [of July 8] had been tried—notably the ones that beds in infectious-diseases hospitals should be used, and that patients should have treatment in their own homes.

Miss HERBISON said that was quite wrong. Already, as she had pointed out, there were 300 beds, most of them coming from infectious-diseases hospitals; and certain steps in the direction of domiciliary treatment had been taken in the auxiliary services.

Sir DAVID ROBERTSON said there were only 10 beds for tuberculosis patients in the county of Caithness, and a large number of sufferers were walking about in great danger for whom accommodation could be found.

Mr. ELLIOT asked if recent figures showed a rise or fall in the trend of notifications, and if the number of deaths—which was recently notable—continued, or was it slacking off.

Miss HERBISON said the number of notifications for the whole of Scotland had gone down slightly. In the number of deaths in the 16 principal towns in Scotland there had been about a 20% decrease during the last year.

Dr. CHARLES HILL pointed out that there were 1,000 beds available in Switzerland for the treatment of tuberculosis, and suggested the restoration of the scheme by which public money was made available to enable persons to obtain treatment in Switzerland.

Mr. JOHN HYND said the question whether Swiss treatment was suitable for all these cases should be seriously considered before the taxpayer was involved in any considerable expenditure.

Mr. ELLIOT said it was a case of relieving the overloaded bed system in this country.

Miss HERBISON said that she could give no information on the subject of Swiss sanatoria.

Replying to Mr. CARMICHAEL, Miss HERBISON stated that Glasgow's waiting-list of tuberculosis patients at June 30 this year showed an improvement of 205 compared with last year.

Treatment in Switzerland

Miss WARD asked the Minister of Health on July 27 whether, in view of a recent decision to accommodate tuberculous patients in general hospitals, he would introduce legislation to enable him to subsidize tuberculous patients recommended by local authorities for treatment in Switzerland. Lord MALCOLM DOUGLAS-HAMILTON also asked the Minister whether, in view of the increase in pulmonary tuberculosis in Great Britain, he would take steps to provide funds to enable tuberculosis patients in the lower income groups to undergo sanatorium treatment in Switzerland, as was at present done by Holland, and as was formerly done by our own local authorities prior to 1939.

Mr. BEVAN said that he could not undertake in present circumstances to add to the cost of the Health Service as proposed; but he had recommended to hospital authorities action for making the best use of their own resources.

Empty Beds

Mr. MARPLES asked how many beds which were suitable for tuberculous patients were empty; and how many could be used if there were staff available.

Mr. BEVAN said that hospital returns at December 31 last showed that approximately 5,000 such beds had been unoccupied on that date, of which about 4,000 stood closed for lack of staff.

Chest Physicians' Contracts

Mr. KABERRY asked the Minister of Health on July 27 why the Leeds Regional Hospital Board continued to delay the presentation of contracts to chest physicians within that region; why the board could not now define the point of entry to the salary scale proposed by the board for each chest physician within that region, and pay forthwith all arrears of salary from July 5, 1948.

Mr. BEVAN said that action by the board must await settlement of the general question of the basis of employment of these officers, which was under discussion with the local authority associations and the medical profession.

Sanitary-Inspector Students

Mr. KING asked the Minister of Health on July 27 if he was aware that ex-Service students recruited into and educated for sanitary inspectorship under his department's health training scheme were finding it difficult to obtain employment in their profession; and what steps he proposed to see that they were absorbed into the profession.

Mr. BEVAN said he was aware that some students had not found immediate employment. Appointments of sanitary inspectors were made by local authorities. He was accordingly in no position to ensure the employment as such of any person. Employing authorities must advertise vacancies, and he was sure they might be relied on to give due consideration to applications from ex-Service men.

Mental Officers' Retirement

Mr. RANKIN asked the Secretary of State for Scotland on July 25 if he would state the reasons for the decision of the Western Regional Board to enforce the retirement of all officers in their asylums and mental institutions who had reached the age of 60 years.

Miss HERBISON, the Under-Secretary, replied that she was informed by the Western Regional Hospital Board that they had taken no such decision, and that in fact many mental health officers over the age of 60 were employed in the region.

Doctors' Prescription

Mr. DRIBERG asked the Minister of Health on July 27 if he would investigate the circumstances in which a general practitioner, of whose identity he had been informed, had been notified that he should not have prescribed charcoal biscuits for a patient and that the cost of this medicament was to be deducted from his remuneration; and if he would make a statement.

Mr. BEVAN said the regulations provided a proper procedure for determining whether doubtful substances were drugs in the circumstances of a particular case and for the recovery from the general practitioner of the cost of any substances prescribed which were not drugs. Charcoal biscuits were normally regarded as food, and as such should not be prescribed at the cost of the National Health Service.

Mr. GEOFFREY COOPER asked the Minister of Health on July 28 whether, having regard to the views of the Cohen Committee on Prescribing that preparations advertised direct to the public should not be prescribed under the National Health Service, he would assist doctors by providing them with a list of equivalent preparations; and if he would forbid the use of such advertised proprietary medicines under the Service.

Mr. BEVAN said a list of official counterparts of proprietary preparations was given in the *National Formulary*. Doctors had already been asked not to order proprietary preparations where the alternative standard drug could be ordered without detriment to the patient's condition.

Bone Induction Hearing-aids

Mr. LESLIE HALE asked the Minister of Health on July 27 on what date it was proposed that a bone induction hearing-aid would be available for distribution under the provisions of the National Health Service.

Mr. BEVAN said that trials of a modified aid were now being arranged, but it was too early to say when supplies would be available generally.

Suture Needles

Lady TWEEDSMUIR asked the Minister of Health on July 27 whether, in view of the acute shortage of surgical suture needles in Aberdeen, Edinburgh, and Glasgow, he would assist manufacturers to increase supplies as a matter of urgency.

Mr. BLENKINSOP, the Parliamentary Secretary, said the Minister had been taking steps to assist the manufacturers to increase supplies.

Surgical Appliance Contracts

Mr. OSBORNE asked the Minister of Pensions on July 25 if he would permit pensioners to purchase surgical boots from any supplier provided they were prepared to pay the extra cost of better-quality boots; and if he would make a statement on the conference about this subject recently held at Blackpool with representatives of the Surgical Instrument Makers' Association.

Mr. MARQUAND said the surgical boots supplied by his Department were made from best-quality materials requiring a high standard of workmanship. He was satisfied that the requirements of war pensioners were fully safeguarded by the terms of the manufacturers' contracts and by technical inspection. His Department had made contracts for the supply of surgical boots and appliances with 713 firms throughout the country at prices which were considered by them reasonable and fair. A minority of contractors had refused the terms offered by his Department, but he hoped that they would reopen negotiations. He was not prepared to enter into contracts at excessive prices.

Lieutenant-Colonel KINGSMILL asked the Minister of Pensions how many contracts to date for the year 1951 had been placed for surgical boots and appliances with the co-operative societies; and how many through the Surgical Instrument Manufacturers' Association.

Mr. MARQUAND said that for the year 1950–1 contracts had so far been placed with 36 co-operative societies. He had not a complete list of members of the Surgical Instrument Manufacturers' Association, but, of 94 members who were known to be suppliers of surgical boots and appliances, contracts had been placed with 55 and negotiations were proceeding with 18 others.

Smallpox

Mr. VIANT asked the Minister of Health on July 24 what was the definition of a smallpox-infected country; and whether any part of Great Britain was smallpox-infected at the present time.

Mr. BEVAN said the International Sanitary Conventions did not define a smallpox-infected country. No part of Great Britain was infected at the present time.

Lingfield Epileptic Colony

Brigadier MACKESON asked the Minister of Health on July 27 if he would make a statement on the death of Winton Hogben at Lingfield Epileptic Colony, and if he had taken steps to ensure that supervision had been improved.

Mr. BEVAN replied that he had no jurisdiction over this voluntary institution, but he understood that the medical superintendent felt there had been inadequate supervision of this patient and had strengthened the rules governing supervision of patients in bathrooms.

R.A.M.C. Pay and Conditions

Major NIALL MACPHERSON asked the Secretary of State for War on July 27 what was the present deficiency of regular commissioned specialists in all branches of medicine and surgery on the basis of existing establishment of the Royal Army Medical Corps; to what extent the deficiency was being made up by civilian specialists; and what steps he was taking to overcome the shortage of regular specialists at an early date; and also what was the present deficiency of permanent and short-service regular qualified doctors in the Royal Army Medical Corps on the basis of present establishment; and what was the total deficiency after taking into account National Service doctors; and what steps he was taking to overcome the shortage.

Mr. STRACHEY said that the deficiency of regular, including regular short-service, doctors was 381. This figure included 13 specialists. Taking into account National Service doctors the total deficiency was 265, which included 115 specialists. With a view to overcoming these shortages an examination of the rates of pay of doctors and specialists was being carried out. Sixty-six civilian medical practitioners and 10 civilian specialists had been employed, and 49 medical officers, including 12 specialists, had been given type "B" commissions for one or two years or had been granted special deferments. Conditions for short-service commissions for women doctors would shortly be promulgated, and proposals were now under discussion for reopening short-service commissions for specialists which were calculated to attract highly qualified doctors from civil life.

Major MACPHERSON asked if the Secretary of State for War would now bring the emoluments of qualified doctors and specialists serving on regular commissions in the R.A.M.C. into line with those applying under the National Health Service.

Mr. STRACHEY said the rates of pay of medical officers and specialists in the R.A.M.C. were now being examined. Account would be taken of the average earnings of doctors under the National Health Service.

Major MACPHERSON further asked what was the present scale of pay and allowances offered to specialists attached to the R.A.M.C. in a civilian capacity, for home and overseas service, respectively.

Mr. STRACHEY replied that civilian specialists serving at home were paid £1,300 or £1,600 a year according to experience and qualifications. Abroad they were paid £1,800 or £2,200 a year and received an outfit allowance and a local allowance varying from £25 to £425 a year according to the station and whether they were married or single. These allowances were common to all Civil Servants of comparable grades. Free single

accommodation and, in certain stations, free messing were also provided.

Employment of German Doctors

Mr. SORENSEN asked the Secretary of State for the Colonies on July 26 why medical practitioners with German qualifications were allowed to practise in Tanganyika and the Cameroons but not in the Gold Coast, Nigeria, and other Colonies; and, in view of the great need of doctors in all the Colonies not being likely to be met for a long time, whether he would take action to secure the fuller services of German medical practitioners, dentists, and similar professional men.

Mr. GRIFFITHS said there were no special rules about German qualifications as such. In most Colonial territories doctors from outside who wished to practise were required by law to have qualifications recognized by the General Medical Council in the United Kingdom. The law in the former mandated territories, however, gave the local authorities discretion to register practitioners with other qualifications. The recruitment of foreigners for the Government medical services in the Colonies was obviously not free from difficulty, but in fact a number of foreign doctors and dentists had been appointed during the last two or three years. Most of them had obtained British registration.

Pneumoconiosis

Mr. PATON asked the Minister of National Insurance on July 25 if she proposed to amend the relevant regulations to bring within the scope of the Industrial Injuries Act all foundry workers who suffered from a pneumoconiotic condition as a result of being engaged in any process in or around a foundry.

Dr. EDITH SUMMERSKILL said pneumoconiosis was already prescribed in respect of a number of foundry processes where medical evidence indicated there was a risk of contracting the disease, and she was not considering an extension of the scope of the regulations.

Mr. PATON said there was a great deal of evidence of the spread of pneumoconiosis and silicosis in processes other than those prescribed by the regulations. Would it not be simpler and more just if, instead of having to prescribe processes, the basis for eligibility were to be made the existence of the disease in a foundry worker.

Dr. SUMMERSKILL said she was prepared to examine that.

Mr. AWBERY asked what procedure was adopted before a disease was regarded as an industrial disease and was liable to be brought under the Industrial Injuries Act.

Dr. SUMMERSKILL said they had to have convincing medical evidence before it could be attributed to the process.

Whiter Bread

Mr. WEBB, Minister of Food, announced in reply to questions by Wing Commander BULLUS and Dr. STROSS on July 24 that it had been decided to reduce to 80% the extraction rate of flour used for the national loaf. This would be made up of home-milled national flour with a rate of 81%, and a proportion of imported flour with a lower rate. This change, which would take effect on Sunday, August 27, would enable the public to get a whiter and more generally acceptable loaf while still meeting the standards recommended by the Post-War Loaf Conference. It would also add to the quality and quantity of supplies of animal feeding-stuffs.

Dr. STROSS said the 85% extraction rate, together with the high consumption of liquid milk, was responsible in the main for the continuously improving conditions in the health of the nation, and asked the Minister to state now that he did not contemplate any further degradation of that standard.

Mr. WEBB said this was their decision. They had decided that it was possible to reduce the extraction rate at this point because of the high nutritional value of the extra amounts of other kinds of food which they were now able to supply.

Dr. STROSS asked the Minister what was the iron content of wheaten flour at the rates of extraction 85%, 80%, and 72%.

Mr. WEBB said that depended on the grists (the mixtures of wheat). But typical figures for 85%, 80%, and 72% extraction rates were 2.1, 1.65, and 1.25 mg. per 100 g. of flour.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on July 25 a formal welcome was addressed to the International Congress of Anatomists being held at Oxford. The honorary degree of D.C.L. was conferred on Viscount Addison, P.C., M.D., F.R.C.S., Lord Privy Seal, and the honorary degree of D.Sc. on Professor G. W. Corner, director of the Carnegie Institute of Embryology, Professor M. W. Woerdeman, Professor of Anatomy at Amsterdam, and Mr. L. S. B. Leakey, Curator of the Coryndon Museum, Nairobi.

In a Congregation held on July 15 the following degrees were conferred:

D.M.—*W. D. Brinton.

B.M.—D. J. Goldsmid, C. N. Watson, J. D. Cairns, G. C. R. Morris, J. Taylor, J. G. Armstrong, J. M. L. Gilks, G. E. D. Morrhall, W. W. Slack, W. A. Openshaw, J. R. W. Gleave, R. F. Brown, M. J. Evans, J. L. Galbraith, Mrs. Margaret E. H. Warwick, Margery P. S. Woolf, *M. J. Rosenthall, *Jean M. Shanks, *Anne S. Fowkes.

*In absence.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the Royal College of Physicians of London held on July 27, with the President, Dr. W. Russell Brain, in the chair, the following Fellows were elected officers for the ensuing year: *Censors*, J. F. Smith, A. H. Douthwaite, F. J. Nattrass, K. E. Harris; *Treasurer*, W. G. Barnard; *Registrar*, Sir Harold Boldero; *Harveian Librarian*, E. C. Dodds, F.R.S.; *Assistant Registrar*, M. I. A. Hunter.

Sir Archibald Gray was appointed Harveian Orator and Dr. D. H. Brinton Bradshaw Lecturer, both for 1951. The following Lecturers were also appointed: Lumleian (1951), Sir Adolphe Abrahams; Goulstonian (1951), Dr. H. J. Anderson; Oliver-Sharpey (1951), Professor K. J. Franklin; Milroy (1951), Dr. J. C. Broom; Croonian (1952), Dr. E. B. Strauss; FitzPatrick (1951), Dr. W. Brockbank; Mitchell (1951), Dr. W. E. Lloyd.

The President, Dr. Russell Brain, was elected the College representative on the General Medical Council and on the governing body of the British Postgraduate Medical Federation.

The Bisset Hawkins Medal was awarded to Sir Wilson Jameson in recognition of his services in promoting public health during the past ten years while he was Chief Medical Officer of the Ministry of Health.

The Gilbert Blane Gold Medal for 1950 was awarded to Surgeon Commander E. B. Martin, R.N., and the Murchison Scholarship to Dr. J. C. Mitchell.

The appointments of Dr. W. D. W. Brooks as a member of the Prophit Committee, Dr. Alice Stewart as a member of the Rheumatic Fever Committee, and Dr. Mildred Creak as a member of the Psychological Medicine Committee were confirmed.

The following having satisfied the Censors' Board were elected Members of the College: E. M. Backett, M.B., J. C. Batten, M.B., J. S. K. Boyd, M.D., E. G. Brownell, M.D., A. W. Capon, M.B., T. Chelvarajah, L.M.S., P. R. Clay, B.M., Betty L. Coles, M.B., D. H. Collins, M.D., A. E. Doyle, M.B., R. I. Eakin, M.B., W. J. D. Eberlie, M.B., R. Fife, M.B., T. R. L. Finnegan, M.B., W. Fox, M.B., E. N. Gauld, M.B., S. B. Hall, M.D., A. C. Hayton, M.B., J. B. Holroyd, M.B., G. Howells, M.B., M. C. Joseph, M.B., W. A. E. Karunaratne, M.D., S. E. Large, M.B., Major, R.A.M.C., G. L. McDonald, M.B., C. McIver, M.B., H. W. Matthews, M.B., Lieutenant, R.A.M.C., W. R. May, M.B., S. S. Meighan, jun., M.B., J. S. Menzies, M.D., A. W. N. Oatway, M.B., Margaret M. O'Hare, M.B., L. I. Phillips, M.B., Muriel E. Port, M.B., G. S. Ratnavale, M.B., B. Stone, M.B., T. J. Thomson, M.B., W. J. Walkden, M.B., A. P. Waterson, M.B., J. A. Waycott, M.B., R. G. Welch, M.B., E. Williams, M.B.

Licences to practise were conferred upon 107 candidates (including 15 women) who have passed the final examination in Medicine, Surgery, and Midwifery of the Conjoint Board and who have complied with the necessary by-laws: K. R. Aberdour, D. Abse, Lilian B. Ackermann, Sheleagh E. Aldersmith, R. J. Ancill, M. J. Argyrides, B. H. Bass, W. H. G. Batham, Barbara E. Batty, H. H. G. Bell, J. C. Betts, Hyla M. Birks, F. R. Brearley, J. M. Brown, B. H. Burne, G. E. H. Callebaut, T. H. Christie, D. J. Coleman, H. G. Cooper, H. D. Cullimore, H. J. B. Day, A. R. de C. Deacock, J. C. Dilley, P. Dinmore, W. A. W. Dutton, M. A. Ebrahim, H. B. Eckstein, J. A. Eddington, P. C. Fleming, R. Fleming, J. H. G. Ford, N. S. Galbraith, L. E. Garrett, Angela M. Geere, R. E. Gibson, A. L. A. Gill, S. C. Gomez, J. Gower, B. P. Green, J. L. Griffiths, R. Hart, R. F. Harvey, C. McL. Hewat, R. Hill, R. Hinchcliffe, E. R. Heuhns, Anne Isaac, G. Jessup, P. E. E. Kann, F. M. Kinsman,

S. F. Knipe, S. S. Lazarus, D. Lennie, H. E. Lewis, J. A. F. Lord, J. W. McCloy, R. F. McKnight, Sheina A. Maclean, M. K. Mason, Jennie C. Maurice-Jones, W. C. Mok, R. D. Morbey, Ann E. Morgan, A. H. Mortimer, G. M. Murphy, R. N. Nauth-Misir, T. O. O. Ogunlesi, D. W. Orton, E. M. Orton, Kathleen M. Parker, J. W. Parkin, J. A. Pedler, L. H. Pell, J. E. H. Pendower, Joan K. Perkins, D. A. Plomer, A. J. Redenham, G. D. Rees, Alison M. Richardson, E. H. Roffey, I. M. Rosen, N. L. Rowe, K. E. K. Rowson, Hilary G. Rubin, P. W. Ruggles, P. S. B. Russell, M. R. Salkind, Gwendoline D. Salter, D. I. Segall, H. Silver, P. R. Stevens, E. Stokoe, D. T. I. Stuttaford, G. C. Swain, D. R. Sweetnam, Gwendolyn R. Tapp, I. O. Taylor, W. C. T. Thomas, G. W. Thorpe, J. G. Turner, W. J. A. H. Turner, J. M. Walker, H. B. G. Webb, J. A. Williams, K. G. Williams, R. I. J. Williams, D. Wiseman.

Diplomas in Medical Radio-Diagnosis, in Medical Radiotherapy, in Laryngology and Otology, in Psychological Medicine, in Anaesthetics, in Tropical Medicine and Hygiene, and in Child Health were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

Other diplomas were granted, jointly with the Royal College of Surgeons of England, as follows:

DIPLOMA IN PUBLIC HEALTH.—N. J. Caldwell, M. J. Collins, R. E. C. Copithorne, Audrey T. Evans, K. C. Mackenzie, N. Newman, J. O'Callaghan, R. O'Farrell.

DIPLOMA IN OPHTHALMOLOGY.—M. Alimuddin, H. L. Backhouse, R. H. Baird, J. C. Bass, Fiona M. Bennett, W. G. C. Craigen, R. P. Dhanda, D. B. Dunlop, R. Ebenezer, R. F. Elliott, Nora M. English, B. Ibrahim, B. U. Killen, Ella I. Mackinnon, S. Prakash, P. K. Rai Chaudhuri, A. V. Rajagopal, J. P. Robinson, T. R. Sakhuja, J. H. Scott, K.-Y. Sun.

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.—P. H. Ball, R. N. Bulsara, R. B. W. A. Cole, P. C. Ghosh, Margaret M. Harley, M. C. Head, Anna J. Kesson, J. M. McKeogh, R. A. Morris, D. J. O'Connor, J. Ll. J. Phillips, D. Plum, T. F. Roche, F. Saif, L. F. Samut, A. G. Shanks, J. R. C. Spicer, H. S. Sweet, D. S. Thomson, Ll. M. Weerekoon.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the Royal College of Surgeons of England held on July 13, Sir Cecil Wakeley was re-elected President for the ensuing year, and Professor Ernest Finch and Mr. P. H. Mitchiner were elected vice-presidents.

Mr. A. Hedley Whyte, Mr. E. W. Riches, Sir Arthur Porritt, and Professor A. M. Claye were admitted as Members of the Council.

Professors and Lecturers for the ensuing year were appointed as follows:

Hunterian Professors.—Mr. A. W. Allen, one lecture on modern trends in colonic surgery; Mr. R. T. Johnson, one lecture on carotid ligation for intracranial aneurysms: review of 100 cases; Professor Milroy A. Paul, one lecture on the blood and lymph pathways in the spermatic cord; Mr. A. Wilfrid Adams, one lecture on the range and results of transurethral surgery; Mr. Denis J. Browne, one lecture on congenital deformities of mechanical origin, their pathology and treatment; Mr. Harvey Jackson, one lecture on tumours of the orbit; Mr. F. G. Hollands, one lecture on malignant disease of the urinary bladder; Mr. P. G. L. Essex-Lopresti, one lecture on fractures of the os calcis; Mr. J. C. Goligher, one lecture on the functional results following sphincter-saving excisions of the rectum; Mr. C. A. R. Schulenburg, one lecture on adamantinoma; Mr. B. N. Brooke, one lecture on the surgery of ulcerative colitis; Mr. Arthur Naylor, one lecture on brachial neuritis, with particular reference to lesions of the cervical intervertebral disks; Mr. R. P. Jepson, one lecture on a clinical and physiological study of 200 cases of severe Raynaud's phenomenon.

Arris and Gale Lecturers.—Professor J. M. Yoffey, one lecture in the form of a film of the lymphatic system; Mr. J. B. Kinmonth, one lecture on surgical physiology of large arteries, with particular reference to traumatic spasm; Mr. W. J. Dempster, one lecture on some problems involved in homotransplantation of tissues, with particular reference to skin.

Erasmus Wilson Demonstrators.—Mr. C. E. Shattock, two demonstrations; Mr. P. H. Mitchiner, two demonstrations; Mr. L. W. Proger, two demonstrations.

Arnott Demonstrators.—Mr. R. J. Last, two demonstrations; Dr. F. S. Gorrill, two demonstrations; Dr. H. D. Ross, two demonstrations, with a discussion of the pathology of reactive and neoplastic changes in synovial tissues, illustrated by specimens from the museum.

Professor David Slome, Professor of Applied Physiology, was also appointed as Bernhard Baron Research Professor.

The Macloghlin Scholarship for 1950 was awarded to John Julius Fryatt of Lewes County School.

Diplomas of Fellowship were awarded as follows: W. E. Wimberger, N. T. Holden, J. B. David, S. H. Janikoun, R. P. Crick, J. D. Randall, G. H. D. Channing, J. G. Craddock, W. Sewell, R. O. Wheeler, R. S. Henderson, J. G. Stubbs, A. J. Evans, L. R. McLaren, D. T. R. Evans, P. R. Sondhi, O. M. Jonathan, A. M. B. Tompkin, R. H. Maudsley, H. O. Williams, J. P. Hopewell, J. D. Trethowan, R. H. Sewell, R. R. Burn, J. E. L. Price, C. G. Attenborough, G. S. Yeoh, D. A. Bailey, J. Upsdell, C. W. Graham-Stewart, L. T. Cotton, K. D. Roberts, L. F. Tinckler, N. C. D. Pizey, A. J. Ruzicka, E. J. Newton, K. K. Ghosh, D. F. de S. Goonawardena, A. Hirtstein, A. B. May, R. V. Singh, M. D. Gelfand, T. M. Hennebry, K. W. B. Rostron, G. S. M. Wilson, A. F. Marshall, E. Hoffmann, B. M. Pujari, O. H. Schneider, S. E. Seneviratne, A. Ashworth, J. L. Bignell, A. T. S. Paul, M. A. Sadek, P. K. Chatterjea, A. M. M. Farag, J. M. Jalundhwala, W. Paterson, H. J. Richards, P. Sivasubramaniam, D. S. Chapman, I. A. Lester, J. F. McInerney, P. W. E. Moore, C. A. Simmons, H. F. Smith, J. H. Cloke, B. S. Crawford, G. M. Goodson, G. W. H. James, P. N. S. Jayaswal, T. P. Leadman, N. C. Mackillop, A. W. Middleton, J. H. Shelswell, I. B. Taylor, J. H. Brown, M. D. Cremin, T. G. Crombie, D. P. Greaves, M. H. M. Harrison, S. J. Hersch, J. R. Hoseltine, A. A. Jefferson, P. Jewsbury, A. U. Khan, R. Merryweather, A. G. Quinlan, F. G. Smiddy, J. W. Sutherland, W. L. Thompson, R. G. Turner, R. M. T. Walker-Brash, T. J. Wilmot, K. C. Wybar, R. E. Aitken, D. M. Bell, A. R. Cockerell, L. A. Eckert, B. Hurst, C. H. Kinder, W. L. F. Utley, R. G. Webb, B. N. Catchpole, W. D. Corfield, D. A. Gibson, J. Hankinson, I. A. McDonald, R. G. C. MacLaren, D. E. Savage, R. H. C. Robins, M. S. Strong.

A Diploma of Membership was awarded to Robert Foster McKnight (St. Thomas's Hospital).

Dr. George Edward was appointed Frederick Hewitt Lecturer.

J. C. Nicholson, D. Blatchley, A. G. Shields, and H. R. Sheppard were elected Fellows of the Faculty of Anaesthetists.

Diplomas were granted, jointly with the Royal College of Physicians of London, to the following successful candidates:

DIPLOMA IN MEDICAL RADIO-DIAGNOSIS.—Violet Auld, E. A. Beetles, H. S. Bennett, N. N. Blaxland, D. J. Chapman, H. Clain, D. Cockcroft, W. J. J. Czyzewski, I. O. Faiman, S. Ghose, D. T. Glass, G. L. Hardman, R. T. Hastings-James, V. Hay-Bolton, R. M. Hector, K. E. Hodge, F. H. Howarth, D. C. Light, M. J. Lochrin, J. K. McCabe, R. P. C. MacDonald, E. V. M. Medill, I. R. Moyle, A. H. R. Muir, J. J. O'Connell, S. N. Prasad, L. L. Ralph, J. A. Rankin, D. F. Reynolds, K. A. Rowley, M. G. Scott, D. Sircar, W. H. Smith, R. F. Stubbs, G. J. MacA. Teunon, T. F. Thomas, W. R. R. Thursfield, E. A. Waldron, D. A. H. Walton, H. B. Ll. Williams, A. R. C. Young.

DIPLOMA IN MEDICAL RADIOTHERAPY.—J. Ackerley, F. Batley, F. M. Benton, L. G. Capra, P. K. Dutt, A. J. H. Henning, Dorothy M. E. McGuire, I. McHattie, P. K. Mookherjee, Dorothy J. D. Smith, J. E. Stapleton.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.—N. Ahmad, M. Amjad Ali, C. R. Black, A. C. Camm, A. R. Curtis, H. A. Fraser, D. S. Gideon, B. S. Hilliar, H. M. Mann, G. S. Ramachandran, V. Rasanayagam, M. Shawaf, M. S. Strong.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—M. W. Annear, A. L. Galea, M. M. Glatt, E. L. Ives, S. F. Lindsay, S. J. Rydlewski, A. R. Samuel, J. E. G. Vincenzi, J. H. S. Whyte, G. M. Woddis.

DIPLOMA IN ANAESTHETICS.—R. C. Allison, W. E. Arnold, D. A. N. Barran, J. K. Black, H. R. Blades, S. O. Bramwell, C. P. Brown, D. H. P. Cope, Sheila A. Costello, A. S. Crawford, Celia M. Davies, P. S. Dearden, J. W. Dundee, D. A. Forbes, Marion G. Foster, F. N. Gabali, R. Ghose, C. M. H. Gunaratne, W. S. Hart, E. H. Hopkinson, R. A. House, Evelyn M. Lafferty, R. E. Lee, Mair Llewelyn, N. G. Marshall, D. Matheson, C. J. J. Morkane, T. P. Murray, Barbara M. Parker, Cynthia M. Parrott, K. A. S. M. A. Quader, D. E. G. Sayers, W. M. Smeeton, A. E. Smith, D. I. H. Smith, W. J. Tyson, A. B. Ward.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—S. H. Shah.

DIPLOMA IN CHILD HEALTH.—Edith J. R. Parfit, K. Prabhakar.

Regulations were approved for the award of the James Berry Prize endowed by Lady Berry.

The award of the Mackenzie Mackinnon Research Fellowship to Mr. R. S. Murley was reported.

The following hospitals were recognized under paragraph 23 of the Fellowship regulations: Beckett Hospital, Barnsley (resident surgical officer); Clatterbridge General Hospital, Bebington (resident surgical officer, first and second house-surgeons); Royal Victoria Hospital, Dover (senior house-surgeon); City General Hospital, Stoke-on-Trent (surgical registrar, first and second and third house-surgeons, ear, nose, and throat registrar).

The National Association for Mental Health has published the proceedings of the conference on "Mental Health and the Family" held on March 23–24 this year. The proceedings are obtainable for 5s. from the association at Maurice Craig House, 39, Queen Anne Street, London, W.1.

No. 28

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended July 15.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. *Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for:* (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland. A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infections	33	1	18	—	1	39	4	15	1	—
Deaths		—	1				—	—		
Diphtheria	50	2	12	3	3	103	27	26	3	5
Deaths	—	—	—	—	—	1	1	—	—	—
Dysentery	222	19	87	—	1	59	10	27	1	—
Deaths		—			—				—	—
Encephalitis, acute	8	1	—	—	—	9	2	1	—	—
Deaths		—		—			—			
Erysipelas			11	4	3			14	5	1
Deaths				—			—			
Infective enteritis or diarrhoea under 2 years				27					55	
Deaths	9		4	2	—	37	2	4	—	3
Measles*	9,295	647	267	321	128	5,571	523	122	228	117
Deaths†		—	1	—	—			—	1	—
Ophthalmia neonatorum	29	1	6	—	—	29	3	6	—	—
Deaths										
Paratyphoid fever	9	2	—	1 (B)	—	32	2	2 (B)	—	—
Deaths	—		—		—	1	—	—	1	—
Pneumonia, influenzal	315	18	2	—	1	346	13	4	2	5
Deaths (from influenza)‡	—	—	—	1	—	6	2	—	—	1
Pneumonia, primary			96	¶				130	23	
Deaths	109	8		6	7	115	12		3	5
Poliomyelitis, acute	212	8	49	5	12	77	6	6	1	—
Deaths§	7	—		—		6	—			
Puerperal fever		—	1	2			—	16		
Deaths										
Puerperal pyrexia‖	67	7	10	—	4	103	9	7	1	—
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,175	63	92	76	47	946	66	130	53	29
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—		—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	3	1	3	1	—	5	2	—	6	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough	4,117	256	240	62	25	2,183	92	34	73	88
Deaths	6	2	—	1	—	6	—	—	—	—
Deaths (0–1 year)	209	29	31	19	13	239	22	30	13	18
Deaths (excluding stillbirths)	4,098	595	514	155	83	3,910	590	496	172	121
Annual death rate (per 1,000 persons living)			10·3					9·9	10·7	
Live births	7,317	1219	866	348	193	7,690	1225	986	482	248
Annual rate per 1,000 persons living			17·4					19·8	29·9	
Stillbirths	153	21	25			185	26	34		
Rate per 1,000 total births (including stillborn)			28					33		

* Measles is not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

Notifications of poliomyelitis in the week ended July 22 were: paralytic cases 189 (152); non-paralytic 71 (60); total 260 (212). The figures for the previous week are shown in parentheses. London had 20 more cases than last week, Warwick 5 more, Stafford 3 more, Essex 3 more, Worcester 2 more, and Lancaster 2 more. Four counties together contributed 46% (119 cases) of the total notifications for the week under review—namely, Warwick 43, London 28, Lancaster 24, Stafford 24. Most of the increase in notifications for the week ended July 22 were in areas where the disease was already present, and there is no evidence of any considerable spread elsewhere.

Anthrax in Cattle

An outbreak of anthrax in cattle has occurred at Holme Pastures, Sutton-on-Trent, Nottinghamshire. Nine cattle have died, but at the time of going to press the cause of death has not been bacteriologically proved in all cases. The outbreak is regarded as exceptionally severe.

Discussion of Table

In *England and Wales* there were increases in the notifications of measles 340, whooping-cough 183, scarlet fever 144, acute pneumonia 34, while the only decreases were dysentery 56, and diphtheria 13. Large changes in the trend of measles were recorded in only a few counties; the largest rises were Lancashire 329, Yorkshire West Riding 141, Dorset 66; and the largest falls were Middlesex 118 and Hertfordshire 77. Most of the increase in the incidence of scarlet fever occurred in the southern section of the country; in London and the south-east counties the notifications were 73 more than in the preceding week.

The chief features of the returns for diphtheria were an increase of 5 notifications in Lancashire and a decrease of 7 in Durham. The largest increases of whooping-cough were in Nottinghamshire 55, Lancashire 49, and Sussex 42, while the only large decrease was 71 in Durham. The fall in notifications of dysentery was due to the experience in Lancashire, where 55 fewer cases were recorded than in the preceding week. The largest returns for dysentery were Lancashire 83 (Preston C.B. 26, Oldham C.B. 12, Royton U.D. 8); Yorkshire West Riding 36 (Bradford C.B. 10); London 19; Northumberland 16 (Newcastle-upon-Tyne C.B. 12).

The notifications of poliomyelitis were the same as in the preceding week. The largest centres of infection were Warwickshire 38 (Birmingham C.B. 29, Sutton Coldfield M.B. 4); Lancashire 22 (Liverpool C.B. 9); Staffordshire 21 (Rowley Regis M.B. 4, Sedgley U.D. 5); Northumberland 16 (Newcastle-upon-Tyne C.B. 8); Worcestershire 11 (Halesowen M.B. 4); Yorkshire West Riding 11; Essex 10; Gloucestershire 9 (Cheltenham M.B. 4); London 8; Middlesex 7; Nottinghamshire 6; Leicestershire 5 (Leicester C.B. 5); Durham 5; Carmarthenshire 5.

The only large outbreak of food-poisoning notified during the week was in Durham, Easington R.D., with 249 cases.

In *Scotland* there were decreases in notifications of measles 127, whooping-cough 41, scarlet fever 26, acute primary pneumonia 19, while the only increase of any size was 7 for acute poliomyelitis. The fall in the incidence of scarlet fever occurred in the Western area. Although the number of notifications of dysentery were the same as in the preceding week, an increase of 20 was recorded in the Western area due to outbreaks in Dumfries 16 and Kilmarnock 10. The other important returns for dysentery were Glasgow 33 (a decrease of 9), Edinburgh 10, and Dundee 8. The largest returns for acute poliomyelitis were Glasgow 15, Fife county 7, Lanark county 5, Renfrew county 4.

In *Eire* an increase of 102 occurred in the notifications of measles and a decrease of 23 was recorded for whooping-cough. The largest returns for measles were Dublin C.B. 124; Dublin, Dublin South R.D. 48; Meath, Dunslaughlin R.D. 33.

In *Northern Ireland* there were decreases in measles 37, scarlet fever 23, whooping-cough 19.

Statistical Review, 1948

Part I (Medical) of the Registrar-General's *Statistical Review for 1948* records that the crude death rate during the year was 11.0, the lowest ever recorded in England and Wales, and 0.4 below the previous lowest rate recorded in 1930. The infant mortality was 34 per 1,000 related live births and was the lowest ever recorded, being 7 below the previous low level of 1947. Cancer accounted for 16.9% of all deaths compared with 15.1% in 1947. Deaths from coronary disease and angina pectoris showed a further substantial increase, and, even allowing for the change in the age and sex distribution of the population, mortality from this cause has practically been doubled in the last ten years.

Infant Mortality

Provisional figures for the second quarter of this year show that both stillbirths and infant mortality were lowest on record for a June quarter in England and Wales. Stillbirths were 22.5 per 1,000 total births. Infant mortality was 28 per 1,000 related live births, compared with 30 in the June quarter of 1949, and 50 in the same quarter of 1938.

Week Ending July 22

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,153, whooping-cough 3,881, diphtheria 46, measles 8,754, acute pneumonia 293, acute poliomyelitis 260, dysentery 166, paratyphoid 5, typhoid fever 6.

Medical News

Miners' Welfare Commission

The Minister of Fuel and Power has reappointed the Miners' Welfare Commission in accordance with the Coal Industry Nationalization Act of 1946. Viscount Hyndley is chairman. The only medical member is Dr. S. W. Fisher, H.M. Principal Medical Inspector of Mines. Professor E. L. Collis, formerly Talbot Professor of Preventive Medicine in the University of Wales and H.M. Medical Inspector of Factories, has resigned after serving on the commission for over 30 years.

First Prize for Film

The film "The Treatment of Infections of the Hand" was shown at the film section of the International Medical Congress at Verona and awarded first prize. It demonstrates the methods taught in Professor R. S. Pilcher's department at University College Hospital, and was produced under the auspices of the B.M.A. Glaxo Laboratories, Ltd., sponsored the film, and it was produced by the Realist Film Unit, Ltd. A note on it appeared in the *Supplement* of July 29 (p. 71).

Joseph Goldberger Award for 1950

Dr. Fuller Albright, associate professor of medicine at Harvard Medical School, is to receive the Joseph Goldberger Award in Clinical Nutrition for his work on mineral and human metabolism. The award, which is made annually by the American Medical Association, consists of a gold medal and $1,000.

Food Production

The Royal Society of Arts is to award a prize of £500 and a gold medal for a new and outstanding means of promoting the production or the economic utilization of food in Britain. The society gives as examples of its objective: a scheme for encouraging a return to the land; a system to ensure the marketing of perishable food, such as fish or vegetables, in better condition. The prize is given as part of the society's celebrations for the Festival of Britain. Entries must be received by March 1, and the award will be made on May 1, 1951.

Princess Tsahai Memorial Hospital

The Princess Tsahai Memorial Hospital, which has been built at Addis Ababa, will soon be engaging staff. Applications for the post of principal physician should be addressed to the honorary secretary, Miss E. Sylvia Pankhurst, 3, Charteris Road, Woodford Green, Essex.

COMING EVENTS

First-aid and Home-nursing Course

A plan for civil defence having been put into operation by the authorities, the St. John Ambulance Brigade will hold an Intensive First-aid and Home-nursing Course at St. John House, 15–16, Collingham Gardens, London, S.W.5, on September 2 for two weeks. The first week will be on first aid and the second on home nursing, including an examination in each subject after the week's lectures. Anyone is eligible, without obligation, to join the Brigade, and the successful candidate will receive the St. John Ambulance Association certificate. The course will be under the direction of a Brigade county surgeon, and there will be a resident S.R.N. tutor to instruct in home nursing and practical first aid. For further details apply to the Warden at the address above.

Institute of Ophthalmology

The academic year 1950–1 of the Institute of Ophthalmology (University of London) (Judd Street, London, W.C.) will be inaugurated on Wednesday, October 4, at 4.30 p.m., with an address by Dr. W. Russell Brain, President of the Royal College of Physicians of London. The annual dinner of the institute will be held at Claridges Hotel, Brook Street, London, W., at 7.30 p.m. the same day. Past students of the institute and of Moorfields Westminster and Central Eye Hospital are invited to both these functions. Tickets for the annual dinner are 25s. each and may be obtained on application to the secretary of the institute at the above address.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Tuesday

Edinburgh Postgraduate Board for Medicine.—At University New Buildings (Anatomy Lecture Theatre), Edinburgh, August 8, 3.30 p.m., "*Development of Modern Renal Physiology*," by Professor Homer W. Smith (New York).

APPOINTMENTS

Fisher, R. E. W., M.B., B.Ch., D.P.H., D.I.H., Chief Medical Officer, South Eastern Area Gas Board.

Neill, G. A. W., M.D., D.P.H., Barrister-at-law, Medical Officer of Health, County Borough of Barnsley.

Pullan, J. M., M.Chir., F.R.C.S., Part-time Consultant Surgeon, St. Thomas's Hospital, London, S.E.

BIRTHS, MARRIAGES, AND DEATHS

BIRTH

Keeling Roberts.—On July 21, 1950, at The Crescent, Wem, Shropshire, to Margaret (formerly Mayhew) and John Keeling Roberts, M.R.C.S., L.R.C.P., the gift of a son, a brother for Alison—Christopher Stuart.

MARRIAGE

Bailey—Simpson.—On July 26, 1950, at West Kirk, Greenock, John Oswald Bailey, Berrow Court, Edgbaston, Birmingham, to Catherine Gilray Simpson, M.B., Ch.B., D.P.H.

DEATHS

Daniel.—On July 28, 1950, at Gilcroft, Checkendon, Oxfordshire, Peter Lewis Daniel, F.R.C.S., late of 1a, Upper Wimpole Street, London, W.

Hughes.—On July 28 1950, at Pembury Hospital, Kent, Ernest Cranmer Hughes, O.B.E., M.Ch., F.R.C.S., aged 71.

Jamieson.—On July 23, 1950, at 43, George Square, Edinburgh, John Boyd Jamieson, T.D., M.D., F.R.C.S.Ed.

Kennard.—On July 24, 1950, Douglas Frederick Kennard, L.R.C.P.Ed., of Clacton-on-Sea, late of Spitalfields.

Laidlaw.—On July 27, 1950, at 40, Sherbrooke Avenue, Glasgow, Marion Wylie Laidlaw, M.B., Ch.B., wife of Dr. Stuart I. A. Laidlaw, Medical Officer of Health for Glasgow.

Moir.—On July 25, 1950, at Lloran Lodge, Combs, Chapel-en-le-Frith, Edward Moir, L.S.A., D.A.

Solly.—On July 26, 1950, at a Harrogate nursing-home, Ernest Solly, M.B., F.R.C.S., of Strathlea, Coldbath Road, Harrogate, aged 87.

Ward.—On July 30, 1950, at the Manor House, Shelsley Beauchamp, Bernard Joseph Ward, F.R.C.S.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Chondromalacia of the Patella

Q.—*Is chondromalacia of the patella a toxic, nutritional, or vascular disease? What can be done in treatment to prevent pain and destructive changes in the joint?*

A.—Chondromalacia of the patella is characterized by roughening or fibrillation of the articular cartilage of the patella, the joint being otherwise normal. The condition not infrequently begins in young persons. The cause is unknown. Some authorities have attributed it to injury, but others have denied that injury is a significant factor. Clinically, there is aching in the front of the knee, a tendency to recurrent mild effusions, and crepitus in the patello-femoral compartment on movement. In the early stages the bone is not affected and the radiographic appearances are normal. The course is variable. In mild cases the condition is not necessarily progressive; but there is always a risk of the later development of osteoarthritis.

The problem of treatment is difficult. In mild cases radical measures do not seem justified, and resort is usually had to rest (as in a plaster cylinder) or to physiotherapy in the form of short-wave diathermy and muscle development exercises. But when the early development of progressive and painful degenerative arthritis is suspected excision of the patella is probably the wisest course, even in relatively young subjects. Attempts have been made to restore a smooth patellar articular surface by paring away the fibrillated cartilage, but the operation is unlikely to give permanent relief and cannot be recommended. No form of medication—whether it be systemic or by intra-articular injection—can be expected to be of benefit.

Subacute Combined Degeneration

Q.—*In "Any Questions?" of December 31, 1949 (p. 1539), the treatment for subacute combined degeneration was given as "an intensive initial course of liver injections . . . and then two or three times weekly until the condition is much improved." Is there any indication when the patient is getting too much? On the other hand, should the injections be continued for a year or longer at two or three times a week? The case I have in mind is a man of 78 who has been having liver injections for macrocytic anaemia about once a month for the last eight years. During the last year a certain degree of optic atrophy has developed in one eye, with paraesthesia of the feet and other signs. In the last two months there has been some improvement under more intensive treatment. The blood count, which eight years ago was down to 1,500,000, now and for the last few years remains fairly steady at a little over four million, and the red cells are normal in appearance.*

A.—There is no danger of giving too much liver therapy in the treatment of subacute combined degeneration of the spinal cord; the only exception to this is in the small minority of patients who develop sensitivity to liver extracts. In the case mentioned, neurological symptoms have apparently appeared during treatment of the macrocytic anaemia while the blood count was around four million. Optic atrophy is a recognized but rare complication of pernicious anaemia (*Brain*, 1940, 63, 225), and may well be so caused in the case described. The development of neurological symptoms indicates that the dosage of liver extract was inadequate or that the liver preparation used was not fully active, and the clinical response which has occurred with more intensive treatment suggests that the former alternative is correct. The intensive treatment should be continued in view of the presence of optic atrophy and could be supplemented with proteolysed liver by mouth in a dose of 1 oz. twice daily. Visual impairment due to optic atrophy complicating pernicious anaemia usually improves with adequate liver treatment. Vitamin B_{12} has now been shown to be effective in the treatment of pernicious anaemia and of subacute combined degeneration, and this substance in a dosage of 40 μg. twice a week by injection could be given as an alternative to liver injections.

Delayed Reaction to Midge-bites

Q.—*Is there any means of desensitizing a patient who suffers severe and prolonged irritation and swelling following midge- and gnat-bites?*

A.—Severe prolonged irritation and swelling following midge- and gnat-bites is presumably the "delayed" type of reaction which comes on about 24 hours after being bitten and which often lasts some days, and not the "immediate" urticarial type of reaction which comes on in about 30 minutes and is usually of comparatively short duration. Work on similar reactions from mosquito-bites suggests that so far as these delayed reactions are concerned specific desensitization should greatly reduce the inconvenience caused (Heilesen, B., *Acta Allergologica*, 1949, 2, 245 (in English)). An extract from midges and gnats for specific desensitization can be obtained from commercial firms; the dosage and the details of administration vary according to the particular preparation employed. (See also article by Professor R. M. Gordon at p. 316.)

Hyperplesis and Albuminuria

Q.—*What investigations are called for, what is the treatment, and what is the likely prognosis in a case of hyperplesis with paroxysmal albuminuria? The patient is a man of 39, and his blood pressure, which is now 210/140 mm. Hg, has risen gradually since he was first examined six months ago. He complains of severe headaches and occasional vomiting, and during these attacks his urine is loaded with albumin. In the worst of his attacks there was a small retinal exudate. Transient improvement follows venesection or rest in bed for a few weeks. What is the cause of the albuminuria in a case of this kind? Is this the sort of case in which sympathectomy should be considered?*

A.—The albuminuria is a reflection of episodes of extreme hypertension, and is a result rather than a cause of the patient's illness. The diagnosis may well be malignant hypertension, although chronic nephritis is possible. Lumbodorsal sympathectomy should certainly be considered. Preliminary investigations should include renal function tests, examination of urine deposits, intravenous or retrograde pyelography, and perhaps a sedation test, in which the effect on the blood pressure of 3 gr. (0.2 g.) of sodium amytal repeated hourly for three doses is determined. If the results of the renal function tests are fairly good, malignant or severe essential hypertension is the probable diagnosis. Paroxysmal hypertension from pheochromocytoma of the adrenal medulla should be excluded by means of the histamine, tetraethylammonium, and benzodioxine tests, details of which need not be given here. If there is serious impairment of renal function, chronic nephritis is probably responsible for the hypertension, in which case little can be done. Acute episodes of extreme hypertension, headache, and vomiting should be treated with rest in bed, sedatives, and a low sodium diet, whatever the aetiology. Venesection is not advised.

Haemospermia

Q.—*What are the possible causes of haemospermia in a patient aged 58? He is married and free from venereal disease; his occupation necessitates absence from home for regular periods of four months, during which time he is absolutely continent. The condition has occurred three times in the last four years. Can anything be done about it, beyond increased exercise and avoidance of "pelvic congestion"?*

A.—Slight enlargement and congestion of the prostate and a mild vesiculitis are probably the most frequent causes of haemospermia in a patient of this age. However, haemospermia often occurs without any cause being discovered for it, and for lack of any other explanation it is attributed to congestion of the genital tract. Provided that genital tuberculosis and any

form of growth have been excluded (and these are comparatively uncommon explanations) the condition is of no importance. Nothing can be done for it beyond trying a period of sexual continence, and in this case the patient has been continent for over four months without result. He should be told, therefore, not to bother about his condition, which will eventually clear up.

Chronic Pancreatitis and Carcinoma

Q.—*(1) What are the possible causes of death in chronic pancreatitis with an indeterminate type of diabetic blood-sugar curve and in the absence of jaundice or ketosis? (2) Is chronic pancreatitis ever the result of chronic malnutrition, and is it ever regarded as a precancerous condition? (3) How many cases of carcinoma of the pancreas with or without chronic pancreatitis have been reported as dying from spontaneous hypoglycaemia? (4) Do you know of any cases of chronic pancreatitis associated with carcinoma of the pancreas with a diabetic type of blood-sugar curve dying from spontaneous hypoglycaemia while the patient was on ordinary diet and not having insulin?*

A.—(1) A chronic pancreatitis causes loss of weight and energy. Patients lose strength fairly quickly and usually die of an intercurrent disease. The details given in this case are insufficient to make a diagnosis of pancreatitis. A hard tumour in the region of the pancreas is always suggestive, and a barium meal should be given to exclude a tumour in the stomach. An enlarged and hard liver may be present, and secondary metastatic deposits should be sought for. An estimation of the total amount of fat excreted in the stools per day should be made when a diet containing 100 g. of fat is eaten for three days. The presence of undigested meat fibres in the stools should be looked for when the patient is eating meat. An estimation of the diastase in the urine may be useful. Since the sugar tolerance is said to be low the possibility of a bronzed diabetes should be considered. A small portion of the skin should be removed and stained for iron.

(2) The cause of chronic pancreatitis is quite unknown, but it is more likely that it has been responsible for the chronic malnutrition than that the latter has caused the chronic pancreatitis. A carcinoma may arise as a result of the chronic inflammatory condition.

(3) Neither chronic pancreatitis nor carcinoma of the acinous portion of the pancreas causes spontaneous hypoglycaemia. But a carcinoma of the islets of Langerhans is a well-known cause of the condition. Secondary deposits of the islet tumour occur in the liver, and in the end lead to death in hypoglycaemia.

(4) No. Patients with a sugar-tolerance curve suggesting a slight diminution of sugar tolerance sometimes have symptoms of hypoglycaemia, but these are usually very mild and death is most unlikely to occur from this cause. These mild symptoms of hypoglycaemia are not necessarily associated with a chronic pancreatitis or with carcinoma of the pancreas.

Climate and Rheumatoid Arthritis

Q.—*Are there any statistics showing the incidence of rheumatoid arthritis according to climate? During twenty years of practice in the Tropics, in Malaya and India, although mild joint affections were extremely common, I doubt if I ever saw in an Asiatic patient a typical case of rheumatoid arthritis.*

A.—There are no statistics showing the incidence of true rheumatoid arthritis in the Tropics, but it is commonly believed to be rare, though infective arthritis, which may be difficult to distinguish from true rheumatoid arthritis, is a common complication of some tropical diseases. Gonorrhoeal arthritis is said to be common in Nigeria, India, and China, and may be difficult to differentiate. Dr. Julia Morgan, who was associate professor of medicine at Shantung in China, mentions a list of tropical diseases associated with arthritis and others in which arthralgia is common, and says that among natives in the Gulf of Guinea "rheumatic arthritis" is said to be the commonest joint disease (Comroe's *Arthritis and Allied Conditions*, 1944, London). Pemberton states that he had several patients from Arizona, which has a hot dry climate and is generally considered to be favourable for chronic arthritics. There is some evidence that humidity may be more important than temperature and that fluctuations in temperature and humidity, such as are common in Britain, may have an even greater effect.

Lemon Juice and Calcium

Q.—*It is commonly believed among Colonial peoples that lemon juice, when used freely, produces a diminution in the calcium content of the body, especially of the bones. Is there any foundation for this belief?*

A.—Theoretically the organic acids in lemon juice—for example, citric acid—might be expected to precipitate calcium in the gut and hinder its absorption. From a practical point of view, however, there is no evidence that fruit juices, even in large amounts, interfere with the absorption of calcium. After all, relatively large amounts of citrate are added to infants' milk to render it more easily digestible, yet it does not produce rickets in these infants. The acid reaction of the small intestine, from which calcium is absorbed, is probably sufficient to prevent the formation of insoluble calcium salts. It has been found that calcium is quite well absorbed, except at critical levels of vitamin-D intake, even when relatively insoluble compounds are administered, such as calcium silicate.

Insulin Ointment

Q.—*What is the best base or bases for insulin ointment?*

A.—Experiments on the administration of insulin in various ointment bases have proved that this method is valueless.

NOTES AND COMMENTS

Tennis and Golfer's Elbow.—Dr. J. H. CYRIAX (London) writes: Your expert ("Any Questions?" July 15, p. 177) is mistaken in regarding tennis and golfer's elbow as identical. "Tennis elbow" is the term widely adopted for chronic strain of the extensor tendon at the lateral humeral epicondyle; it was first named "lawn-tennis elbow" by Major in 1883. By contrast, golfer's elbow occurs at the medial humeral epicondyle as the result of strain of the common flexor tendon. The distinction has a practical importance, for the usual type of tennis elbow is quickly cured by manipulation (Mills, 1928), whereas the only way to secure swift recovery from a golfer's elbow is adequate deep massage (Cyriax, 1947).

REFERENCES

Cyriax, J., *Rheumatism and Soft Tissue Injuries*, 1947. Cassell, London.
Major, H. P., *British Medical Journal*, 1883, **2**, 557.
Mills, G. P., ibid., 1928, **1**, 12.

Corrections

Mr. MALCOLM DONALDSON (London, W.1) writes: Since my recent visit to America I realize that I used the wrong term in speaking of "tumour clinics" in the second paragraph of my article on "Education of the Public Concerning Cancer" (July 1, p. 35). The clinics at which the patients without any symptoms are examined are, as a rule, called "detection clinics," and the term "tumour clinic" is generally used to mean a weekly consultation of the staff to see all new cases of cancer in order to plan treatment.

Mr. H. J. SEDDON writes from the Royal National Orthopaedic Hospital, Stanmore: May I correct a small but significant slip in your report (July 29, p. 293) of the meeting of the Section of Orthopaedics held at Liverpool on July 19? The mobilizing apparatus used for patients confined to bed for long periods, which has the effect of minimizing skeletal decalcification, is described as if I had invented it. This is not so; both at the meeting and in the MS. of my paper I said that we owed this most valuable innovation to my friend and colleague, Mr. E. J. Nangle.

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